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NEWS IN BRIEF

ICL union gives in

UNION opposition to the closure of ICL's factory at Winsford has now collapsed completely, the local Joint Union Committee having accepted the inevitability of UPL's takeover of the plant with a statement wishing the new owners "CVETY SUCCESS"

Winsford staff have accepted redundancy and severance terms and are facing the prospect of joining others already on the dole in the queue for jobs when UPL starts recruiting, probably around

NatSemi profits

FOR the half-year ended October 1980, National Semiconductor, the semiconductor components group and owner of National Advanced Systems, reports sales of all the group products up 40% to \$628 million. Profits for the half-year were \$33.4 million, up 41%.

US military comms

SPENDING on military communications systems in the US will total \$28.9 billion between 1980 and 1985, rising from \$3.8 billion in 1980 to \$5.4 billion in 1985, according to Frost & Sullivar's latest report on the subject latest report on the subject, number 828. The US Air Force will spend the most and its largest project will be in space commu-

NCR made \$1bn

NCR FINALLY broke the bilion-dollar barrier for turnover in tion of a nine-member "club" of companies aiming to exploit the Laboratory's developments.

Among the members of the Speech Recognition Club are Fernanti, Plessey, Nexos, SDL, and Quest Automation. In return for their subscriptions of £8,000 a year they will receive information about NPL's work for incorporating in the last quarter of 1980. The com-pany reported turnover at \$1,084 million for the three months, 10% up on the closing quarter of 1979. This left turnover for the whole year up 11%, to \$3,322 million. Profit for the year as a whole rose 9% to \$254 million.

Minister calls for viewdata boost

week as Information Technology Minister Kenneth Baker called for said. "Teletext and viewdata are

future of viewdata and teletext, organised by the Department of Industry, Baker warned of the danger of letting the UK's lead slip away and the need to speed up the development of the home market if exports of the systems were to take

The conference steering committee would follow up ideas and proposals made at the conference and contact all the 80 participants in the next few weeks, Baker said. "It would aim to decide on a market strategy which the industry as a whole could accept and to which it could therefore commit itself wholeheartedly."

recognition device using new techniques, and suitable for

dealing with continuous speech, which was devised at the National

Physical Laboratory, should be on

the market within three years.

That is the prediction being made at NPL following the formation of a nine-member "club" of

Minister Kenneth Baker called for a "combined and co-ordinated assault on the market by everyone concerned".

At a private conference on the future of viewdata and teletext, organised by the Department of Industry Baker wasted of the conference on the future of viewdata and teletext, organised by the Department of Industry Baker wasted of the conference of the private organised by the Department of Industry Baker wasted of the conference of so far been unco-ordinated, he

> The world market in informa tion technology products already totalled about £50 billion a year and was expanding at about 10% a

year in real terms. British Telecom agreed to co-ordinate its oversens marketing with the BBC and IBA so as to present twin versions of the same tech-nology. The BBC and IBA agreed to push teletext rather than their two rival implementations of it. The semiconductor industry (chiefly Mullard and General In-

OTHER COMMERCIAL VIEWDATA AND TELETEXT INITIATIVES

Philips investigates residential user needs.... Cheap, all-purpose terminal... TV adapters bring down Prestel costs..... Potential for US services....

to speech recognition, quite dif-ferent from those employed else-where. Instead of using pattern matching to look for words or pho-nemes (the phonetician's classifica-tion of certs of marth) the MDI

tion of parts of words) the NPL

researchers are using special-pur-pose hardware to detect 16 dif-ferent "speech features" which

make up most of the vowels and

million investment to date by de-veloping more advanced chips for viewdata and teletext decoders. Television makers said they would produce smaller and cheaper sets, and the government promised to continue to fund product development, trial services in government departments, public demonstrations and overseas



Four towns figure in Philips' local study

IN concert with the government- find out what kind of information initiated pull-together for viewdata, Philips has announced a trial promotion and investigation of residential user needs, to run for ix months to a year.

The trial is to start in April in Brighton, Bournemouth, Harrogate and Norwich, and Philips is persuading other companies, including rival suppliers, to join in.

Philips plans to take a loss on terminals supplied to rental companies in those towns, to enable them to rent at rates close to the rate for a teletext receiver without making a loss themselves, but the main focus of the trial is to be to NPL sets up technology transfer club

users would want Prestel for. Information providers which publish local information, such as

lastern Counties Newspapers in Norwich, are being asked to extend their databases to include things like bus timetables and supermarket prices.

Philips' viewdata marketing manager Julian Horn-Smith said some questions should be answered before the residential market builds up over the next two or three years, on what sort of pack-age of price, information and selling method would satisfy user

China were signed in 1978.

The SEMS deal is creditals enior French Department d lustry official, who is current leave having spent four me in Peking negotiating the dal. Sources in the Japanese out

end-of-year Tax fortal

now available from the

ห็ดย**mdesi**an

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French

Chinese

mini dea

THE first licensing agreement manufacture Buropean come equipment in China has be

signed in Peking by the Factorial SEMS group.

The deal, still classed at the is worth F100 million (about million) and is for the mamana of the SEMS Solar 164.

The Solar mini is similar at

PDP-11 and has been extend sold in Europe by SEMS & European Space Agency sold tracking operations and rese

Control type applications.
Digital Equipment is u.

derstood to have compositioned strongly against SEMS for help

nese contract but lost at the

minute owing to Chinese pri-

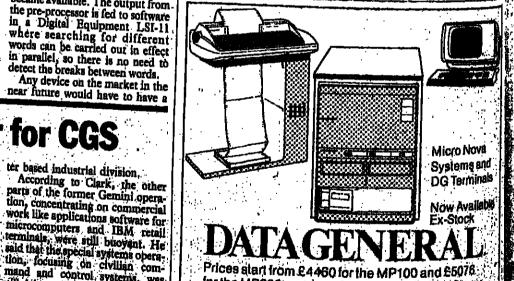
which has extensive governments backing. First agreements being

the governments of France

ter industry are surprised at development. Hischi has extensively to the Chinese hought to be in the front mile

for any licensing agreement.
Additionally, the Japanese poured millions into description for their own 4,00%, Kanji alphabet, which is similar the Chinese alphabet.

their own products — "technology transfer arrangement" in the words of Dr David Schofield, the project manager. Individual considential consultancy will also be available. NPL considers it has made a breakthrough in its basic approach to speech recognition, quite different from those employed elselimited vocabulary of probably a few hundred words. Schofield says, so it could only be used for special applications. Key words could be searched for in continuous speech, but this searching could be done in real time, something that is not feasible at the recently when analogue filter chips became available. The output from



for the MP200 systems. Systems range from lioppy:

Comma offer off the shell delivery of complete

disc through cartridge to Winchester storage

Micro Nova Packaged Systems as well as:

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Interfaces and comprehensive Operating Systems

A good year for CGS

FRENCH software giant CAP Gemini Sogeti has reported im-pressive figures for 1980 which include a turnover up by more than 27% at £55 million and a 33% in-crease in net profits to £2.76 mil-

But the company's UK interest, IAI Gemini, was hit badly in the industrial systems area, in the first full year since its formation, from the former wholks COS owned Gemini and the special systems

Gennia and the Special avstems or side of interpational Actadit.

The general manager of 1/1 of General Peter Clark, rold Computer. Weekly that turnover was down from £400,000 in 1979 to £300,000 last year in the Manches.

work like applications software for microcomputers and IBM retail terminals, were still buoyant. He said that the special systems operation, focusing on civilian command and control systems, was still doing well. Total IAL Germiniturnover for 1980 will probably come to about £1.8 million.

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According to Clark, the other parts of the former Gemini operation, concentrating on commercial work like applications software for

in parallel, so there is no need to

detect the breaks between words.

Any device on the market in the near future would have to have a

come to about £1.8 million:
In 1980 mearly £39 million worth
of CGS business came from the
French company and the rest from
its operations outside Hyancs
which now include a company in
Norway (see Company News).



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Banks come to ICL's rescue in short term

A £50 TO £100 MILLION rescue package based on short term bank loans is being assembled by ICL chairman Philip Chappell, say sources in the City. Citibank is believed to have off ed \$50 million of the control of the lion medium term finance on its

The rescue package has become necessary following a dramatic fall in confidence among ICL's institutional shareholders after a series of unsuccessful meetings between Chappell and City stockbrokers. The brokers and analysts claim that Chappell failed to answer any

of the more pertinent questions put to him. ICL has confirmed that the chairman will make a statement

after the annual meeting next

The more pessimistic Citymen expect Chappell to reveal that the

The more optimistic hope he will reveal a recovery plan which is said to be in the course of urgent preparation.
This plan is expected to contain

details of government backing, not necessarily in cash, for some or all of ICL's R&D programme.

Reshuffle

A major reorganisation of some of the company's operating divi-sions, with a board reshuffle, is also expected. Some sources say that the US operation is under active consideration for a sell-off following the collapse in 1500 sales there, and similar problems in the UK, with 1500, System 10 and

Investing concern now centres on the fate of the large end of the 2900 range. Brokers feel that the

BURROUGHS, the second biggest computer company in
America, made a loss of
\$68,741,000 in the last quarter of
1980. This followed a special
write-off of \$125 million relating to
obsolete and returned machines.

Bullion, up just \$71 million on 1979
sales of \$2,830 billion.

The company, now headed by
Michael Blumenthai, former
Secretary of the US Treasury, has
suffered a severe reverse in profits
obsolete and returned machines.

Billion, up just \$71 million on 1979
fallions on 1979
sales of \$2,830 billion.

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Billion, up just \$71 million on 1979
sales of \$2,830 billion.

Billion, up just \$71 mil

NHS ops call strikes

mation that discussions did take place with ICL as recently as two months ago continue to arouse speculation about some kind of partnership or merger between ICL and a foreign partner.

Some analysts perceive that the company could achieve a significant degree of relief from cash flow pressure if enough destocking took place. The opportunities for doing this are limited if the top-end 2900 ported, and by the fact that the 7500 and 7700 range are still very

short of software.

The possibility of an interna-tional trade embargo on South Africa, following the col!. - of the Geneva conference on Namibia, will present ICL with an early opportunity to step up its sales there, even if the long term pros-

Corrigan sets up ULA plants

by Eileen Stainer

UNCOMMITTED logic arrays (ULAs) have esptured the interest of Wilf Corrigan, ex-chief executive of US electronics controlled pany, Fairchild. Having given up the position after the Schlumberger takeover, Corrigan plans to set up an initial ULA factory in Silicon Valley and a second in the berger takeover, Corrigan plans to set up an initial ULA factory in Silicon Valley and a second in the UK in two to three years' time.

ULAs are a form of custom-built integrated circuit which drastically reduces the cost of de-

on a system that converts phoneti-cally encoded syllables entered on an electronic Palantype keyboard into readable English words. Palantype is the proprietary shorthand system used in US courts of law for recording **Burroughs' \$68 million loss** proceedings on a two-inch paper tape, normally with a mechanical

keyoosid, In the longer term Palantype translation facilities could form an important part of electronic office ing against the company. These are understood to relate to alleged failures in the company's B70 and Despite the gloomy figures Bitter in coming of the claimed that incoming orders are accuracy of translation of the company's future. He claimed that Profit for 1980 as a whole was equipment write-offs, of which incoming orders created new. \$81,972,000, a drop of over \$223 more are expected, but also from a records in 1980 and the year-end loss in customer confidence relations on 1979 profits.

Turn over for 1980 was \$2,902 ing to some 400 lawsuits outstand.

Turn to page 9 incoming orders crosted new, would normally be unsatisfactory for office use.

The real time system used for

the Reagen speech generated

พอ will not use our friendship

While Ronald Reagan made his inaugural address in Washington January 20, BBC Television viewers with Ceefax receivers were able to read subtitles of the speech simultaneously — a "first" in television history. Generated by a shorthand translation system developed at Laicester Polytechnic, the subtitles were far from perfect but were warmly welcomed by many deef-viewers, according to the BBC.

First broadcast using captions from real time shorthand

REAL TIME continuous speech recognition by computer may still be "pie in the sky", but the translation of speech using major step forward last week when Ronald Reagan's inaugural address was subtitled on the BBC's Ceefax teletext service simultaneously

letters from deaf people about them had been "very enthusias-tic", indicating that most of the Reagan speech had been followed. Developed on a Burroughs B6700 mainframe at Leicester, the Palantype translation system was trimmed down for the BBC to run on a Cromemco Z2H microcomvith the live broadcast As part of its efforts to provide deaf viewers with subtitles using Ceefax, the BBC has been sponsor-Turn to page 8 ng work at Leicester Polytechni

any means" according to one of the

Briefing

Soft 81 melts away

SOFT 81, the series of projected software shows across Europe run by European Conference Organisers, has been cancelled because of an internal break between ECO's

"The break-up is not directly to do with the shows themselves," said Soft 81 organiser Robert Joseph, who has left ECO although still technically a director. "It was more a matter of differing views on

Bomb attack

DAMAGE estimated at £90,000 was caused at a Thomson-CSF laboratory in Toulouse on Monda y a bomb set off by a self-styled Laser" terrorist organisation. Laser" is believed to be the name f a group associated with "Clodo", which specialised las year in wrecking computers.

Second customer

POLLOWING the installation of an IBM compatible AS/9000 by Guardian Royal Exchange Assurance, a second customer has been picked up by National Advanced Systems for the 10 mips Hitachibuilt mainframe. It is Overseas Containers Ltd, which chose the AS/9000 in preference to the IBM 3081 and Amdahl 5080. It will be installed at OCL's head office in installed at OCL's head office in

leaders of the project at the BBC, Bill Hawkins. But he added that **Italian delegation**

and Thames Television.

A HIGH-LEVEL delegation from the Italian government has visited the UK to familiarise itself with developments in office automa-tion. The head of the cabinet office, the director-general of the PTT and banking officials visited Nexos, Racal, Muirhead, ASTC,

Turn Quay

erated container facility at Tilbury Docks in Essex. Their minicomputer-based container control system is now an essential part of the daily routine. Visual displays provide interactive cargo planning, taking into account variables such as cargo characteristics and destination. Several hundred thousand units are handled annually

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Focus on first byte
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TA funs into loss
Micro News
Ital problems linger on
Business satellites warning

HRALTH Service computer staff throughout the UK are refusing to pay, bills or operate accounting systems and will have a series of lightning one-day strikes in pursuit; of their national re-grading claim.

This follows last Priday's breakdown of talke at a meeting of the Whitley Council, the body which decides pay in the Health Service. The unions put in a re-grading claim and a joint working which decides pay in the Health Service. However, officials of the unions involved, Nalgo and NUPB, emphasise they would not take any action to put patients.

The dispute has a 20-year history, When computers were introduced into the Health Service into the Health Service in 1975. Nalgo claimed that DP jobs were now paid at between £600 and £3,000 a year below the market rate. The unions put in a re-grading claim and a joint working party was set up on management's invitation.

Struct Balley, West Midlands District Offices (Health) for Nalgo, said, "Our claim will cost £1,200,000 if met in full."

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COMPUTERVIEW

REMEMBER a time before you knew abou computers? You probably knew about Tupperware, Delaware, nowhere and underwear, but you didn't know about hardware and software. For many, these two computers? You probably knew about Tupwords, which conveniently separate the kickable from the unkickable, still have the

ring of jargon.

Computer people are undeniably in a jargon-ridden business and are sometimes forced to defend the language they use. That defence is made more difficult as some of the jargon is sensible — and some is nonsense. We should be mindful of the distinction.

Every trade and every profession has its own share of jargon, which is more or less incomprehensible to other laymen. Dentists, journalists, road crews for pop groups, computer personnel, sailors, tinkers, tailors, soldiers and spies all speak in special tongues. Otherwise-normal people go to work and then talk of hooking up a pink noise generator, or going to the galley be-cause the proof is missing, or singling up to a breast and spring both ends, or finding an

occlusal on an upper left six. Hands up those who can say something ntelligible about, for instance, a multiple

LETTERS to the EDITOR

number of answering machines have become available for purchase, many of which are unsatisfactory, due to their limited efficiently and the ability to receive incoming messages of variable length

not such equipment has Post of dialling tone), or fixed length or

Some jargon is used so widely that it filters into everyday speech and is assimilated

situation not just confined to users

within the computer industry. Over the past year a considerable

ciency and/or reliability, which is not a direct function of whether or

One type of machine that can be

standable irritation of P. Barker

(CW, January 8) at the perform-

machine, and I am concerned that

a number of machines now on the

market could bring the telephone snswering machine manufacturing and distributing industry into con-

Whereas the general public re-cognises the difference between a mini-moke and a Rolls-Royce car,

they do not appear to appreciate that the same variation exists in the

manufacture of telephone an-

swering machines. Since April 1980 machines have been available for outright purchase at what appear to be competitive prices. The fact remains that you only get what you pay for: many of these machines are either limited in their functions on will not stand up to

in the language. The rest of it remains gob- label something without calling up a clear bledegook to all but the initiates. mental picture of it.

Jargon is used for two contradictory is. In some cases it tends to precision and in others it is a vague covering for

sloppy thought.

The first reason — and unfortunately the wrong and most common reason - for using jargon is to give the appearance of signiance when true significance is either being

hidden, or is lacking to start with.

A fine and barbarous example of this significance-seeking came from the mouth of a Ferranti spokesman describing a computer aided design project recently. Asked what exactly was being designed, he replied: "An aerially delivered area denial system." A bomb by any other name. In fact a

particularly nasty bomb with a landmine attachment that does not explode until the area round the crater is thought to be safe. An ongoing area denial situation, so to

Such words are necessary if you want to

sage length and the flexibility of outgoing messages. I would heartily recommend that any user conducive to persuading the caller

It is in the latter context that

most users of answering machines

fail. The creation of an outgoing message tape needs considerable forethought as far as message

content is concerned and the voice

that is used must be articulate and

Thave no idea what types of

paying for an instrument that they wish to have online 24 hours a day.

tal only policy ensured that

machines in use could be traced for

modification and, more impor-

tantly, the customer was and is, entitled with a rental basis, to de-

The message is clear, Businesses should opt for the security of ren-

tal agreements if a reliable, on-

going service is needed. Buying the machine could result in having

Marketing Services Manager

L. JBWELL

no answering machine service

THE EDITOR welcomes let-

ters commenting on subjects published in Com-puter Weeldy, or or original topics. All Jetters must be

writer's name and address not necessarily for publica-

Camberley, Surrey.

mand an immediate service.

Answering machines 'suspicion'

considers only twin cassette machines, which will automatically facilitate a variety of content most users of the communication of the

THE considerable number of letters on unsatisfactory telephone when it comes to incoming mesters on unsatisfactory telephone sage length and the flexibility of the equipment used needs to be

coming messages of variable length (ie the device will switch-off once

it identifies seven seconds duration

By and large, people are as sus-

particularly misleading for the picious of answering machines as a single cassette tape. This leads to many restrictions, particularly equipment for enhancing the level or frequently malfunction. I

30 times to coincide with a 30 in-

coming message taking capacity.
This, of course, is ludicrous and

in addition the machine with this system does not allow for error if

the user makes a mistake in any

one of the 30 recordings. The mis-

take cannot, be erased and a new tape has to be obtained.

Other machines at this end of

the market do not have call coun-

ters and others do not inform the

caller when they are going offline. The net result is that there must be

thousands of people around the country thinking they are talking to a telephone answering machine;

when all they are doing is talking

Prior to April 1980, the Post Office encouraged the use of an swering machines on a rental basis

ACP 80 and the freight forwarder where an executed and the public of the freight forwarder are specified and the freight forwarder and the freight f

inachines are either limited in their only. This was subject to their functions or will not stand up to only. This was subject to their egular like.

The unituspecting new user of and network compatibility and network compatibility machine can in some cases be supposed in find that he or she has for inachine can opening another has for inalities which is an essential requirement where subscribers are

no message at all.

Talking to themselves

Less barbarous but more widespread is Chambers' Dictionary is templar but bears out the distinction bear pretentious and the description the phrase "cost effective", which is endemic among people talking and hawking computers. Salespeople are told to say it instead of "cheap", providing an example of retentious and the descripine.
"Jargon, chatter, uniterial or is stange or in stange or in profession"

It is ultmost by way of a concess definition has jargon as the "laps profession". Unfortunately at his stangent of the an attempt to make the insignificant pale into significance.

At a recent Inforech gathering, a bunch of managers agonised over the vile placase eventually to decide that it meant "to service the user at the lowest possible cost under current environmental circumstances". What's wrong with "cheap at the price"?

Other cost-effective type horrors are trade-off, state of the art, leading edge, implement, parameter, facilitate, flexible, timeframe . . . The second reason why so much jargon is heard, the one which is defensible and espe-

suppose it is like any other type of

equipment, you always get what

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mouthing of too much jargon for stand. There is, however, a feding ity in talking codes and belongings cially pertinent to the computer industry, is a cabal, a profession even. But profession can be interpreted piece of jargon, can't it? There is that it often describes what cannot adequately be described in any other way: new about people in glass houses.,

Job

experience

I AM having the greatest

ience to apply for posters in Computer Weekly.

Most jobs require 23 a perience and when I sti.

get the same answer, "A.

two-year course leading in man

experience and tribles

I here is a local colleged

greed question.

nding out how one gar

professional

pletely sure if we are part of a poste

in an uneasy limbo between a ja

profession. That uncasines a bay

an occasional insistence on being

The uncasiness is also belond

gon of necessity.

Govt and industry to words for new things like make micros, hardware and softwar. Our trade/profession has approximately because it is so new lather that no ostler ever talked about until given a car to look after some ever mentioned updates and power until a word processor came and good good of necessity. collaborate on information technology

funded jointly by government and industry, promises to be one of the first of a series of initiatives by a newly reconstituted Electronics Economic Development Commit-tee (EDC).

The new committee met for the first time last week, as a result of the National Economic Development Council decision, eight months earlier, to set up a group to oversee the rapidly converging and developing areas of telecom cations, computing and microelec-

Inroads

The high-powered committee members representing leading industry and led by Sir Henry Chilver, vice-chancellor of Cran-field Institute of Technology, are unanimous in their belief that the UK can learn from the policies Micro News, page 7), where there is considerably greater co-ordinated action between individual companies, often promoted by government.

After the meeting Sir Henry explained that the UK electronics market had doubled in the last 10 years (adjusted for inflation) with UK manufacturing output dou-bling in the same period. Unfortunately import penetration had also risen, from 20% to 60%, with greatest inroads being made into the computer field.

Greatest scope for governmen help existed in the guidance it could provide to help the industry

keting information. The chief components of the project to be evaluated would be a

There would be no large finan-cial handouts, though considerable

help could be given through a pub-

Balanced

One of the UK's chief problems

was that no companies existed with

capabilities across the whole spec-

trum of information technology, as

was the case with such organisa-tions as IBM and Philips, said Sir

Henry. It was because of this that

mulate plans for a joint public/pri-

vate sector demonstration and

evaluation scheme for advanced

communications technologies.

British Telecom would obviously

Initial plans had centred on the use of a "green fields" site, where

there was negligible existing

cations infrastructure. However,

was felt now that a mature, self-

contained and balanced commu

nity would provide far better mar

play a leading role in this project.

large fibre-optic cable network electronic products, communicat ing office equipment, and distri-buted data processing. Satellite communications (voice and data) would also be examined.

Hurdles

One of the first hurdles of this project seems to have been cleared in that the Electronics EDC has won the support of the major com

The benefits of the demonstra-

tion project are envisaged as its Assess market reaction and test marketing assumptions, such as

1981, a specification of the equipment to be included will have been until 1985.

• Provide a shop window for export sales; and
Stimulate "information providers" to supply data and services for such systems.

demonstration site is one containing a high proportion of com-mercial users to domestic users; a high proportion of well-educated, better-off domestic users; and a dominance of high technology in-

price and elasticity of services;

Stimulate development and pro-

duction of systems and equipment

Provide information to assist

public policy decision, eg UK sa-

or export markets;

ellite policy;

drawa up, and commitments made by participants. However, it is not envisaged that marketing informa-tion would start to be produced

In addition to the demonstration project, the reconstituted EDC will work on a number of other ronts. It will review the structure of existing public arrangements on R&D to ensure they are coherent: t will work to identify mechan isms to encourage both the growth and formation of small firms; and will set up an Employment Task Force to solve manpower shortage

Think of a vacuum cleaner and what has

Yet his was the first upright suction sweeper the

Lack of money, or business acumen? Or was it an

Had our friend been around today however, his

to help teams of technological entrepreneurs set up their

Provided today's Mr. Spanglers can convince us their innovation and chances of success are promising,

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Certainly not J.Murray Spangler.

So why didn't he clean up?

absence of the right business partners?

fate may well have been different.

own businesses.

Probably a little of all three.

we'll back their enthusiasm with our own.

Amdahl to develop solid state file nology is implemented in 16K MOS RAM chips and is expanda-

ble in 11¼-megabyte modules up a maximum of 45 megabytes. ductor paging and swapping file similar to the 4305 sold by Storage Technology as an alternative to the IBM 2305 fixed head disc At £200,000 for the biggest unit, the cost per bit of the 430 compares favourably with fixed head disc storage and is a lot lower than the cost of main memory. According to Storage the 4305 can be sold at this price

One aim of the high speed file project is to take advantage of the six-megabyte per second data transfer rate provided by the block multiplexer channels on the Amdahl 580. This is the machine launched by Amdahl as a counter because main memory charge: are kept artificially high by IBM. The data transfer rate of the 4305 is limited to three megao the IBM 3081 (CW, November bytes per second at the moment

Amdahl sees an I/O bottleneck being created when the 580's channels are linked to the IBM 880 disc drive controller. Its data transfer rate is limited to three megabytes per second, the same as the 3081 channel speed. The 4305 from Storage Tech-

speed, aithough Storage plans to bring out faster models for hosts like the Amdahl 580. Intel also now offers a solid state replacement for the IBM 2305 called the 3805. None has

been sold yet in the UK.

Two 128K ROMs from NEC

ROMs are expected from Nippon Electric in April. Production planned in the second half of the year at a rate of 300,000 devices a

The first, an NMOS device, is

of 275 milliWatts maximum The other has been specified i

CMOS with a four microsecond access time and a 30 milliWatt active power consumption. It will be

B. T. SIE 99 Regent Street, London WIR 7HB panies and trades unions, both of which agree that the performance of the UK industry has been understand the importance of costructure, emphasised Sir Henry. 1 Wilkes Computing For DEC SYSTEMS VAX 11/780 PDP 11/70, 11/34's, 11/44's ICL viewdata for ME29 users ICL's viewdata system, Bulletin, its ability to integrate viewdata is to be available to users of the ICL ME29 in the UK and Holland from next week. its ability to integrate viewdata with existing word processing operations. The system rents for £8,500 a year and terminals can be PDP 11/03, 11/239 viewdata systems, Bulletin was developed by ICL following trials ordered through IGL from Thorn for between £280 and £370 a year. with the Thorntel system used in-Models include a 26-inch house by Thorn Television Rentals on its ICL 1900. It impletates on its ICL 1900, It impletates on its ICL 1900, It impletates on its ICL 1900, It impletates the viewdata capability with either a numeric Reypad or promised for the ME29 at its alphanumeric keyboard built in launch last March, since when over 700 have been sold. It will be available in other countries and for other machines in the ICL car salesman is using the Bulletin remarks for data in Clude a 26-inch house by Inch and a 14-inch business terminal with a television with a remove keypad or alphanumeric keyboard built in. Our picture shows a typical car salesman is using the Bulletin car salesman is using t systems and software for other machines in the ICL car salesman is using the Bulletin range later this year. Bulletin's strength is said to be direct to a computer system. VT 100 LA 120 **LA34 BR** returns to Redifon tome and BRITISH Railways Board has The optical character recognition/ ordered a further seven mixed key-to-disc system conceptrated media computer systems from on applications such as payroll, freight accounting and accounts pilot scheme, started two years payable, ago. Included in the order, worth. The pext phase of the plan runs over £3 million, is a dual R400 data entry system, also from Redifon. The previous £750,000 order was used for the pilot scheme, rently being done on paper tape based at British Rail Birmingham, will be moved to the system. Export Sales BOlestal Ecotoman Company Ltd. Wilkes Computing

HERE'S an interesting twist to the on-going imbroglio over Women's Lib, attested to by an unimpeachable authority, namely, a Computer Weekly

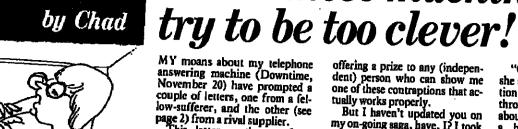
When our Software Editor Claire Gooding was living in South Africa she went into a branch of the Standard Bank to ask for a credit card, expecting the usual expelsion. the usual touchy questions.

Asked the bank man, "How much does your husband earn?"

(listen to Germaine Greer's hackles rising already), Claire re-plied, "1,000 Rand." Then she was asked, "How

much do you carn?"
"700 Rand," she said. That adds up to 1,700 Rand, which is over our lower limit.

l'ine, you can have a card."
At that, Claire was given her card and home she went, satis-



"The automatic phone-an-

the same bank also to get a card. He was asked, "How much do

"1,000 Rand," he replied.
"Sorry, that's not enough — u can't have a card," he was

all, and the poor man eventually stormed home, cardless and fum-ing. He wouldn't speak to Claire for several hours!

MY moans about my telephone answering machine (Downtime, November 20) have prompted a couple of letters, one from a fel-low-sufferer, and the other (see

page 2) from a rival supplier. This latter gentleman, from Ansafone, criticises the design of the GMTC machine under question, which is missing the point altogether. The choice between the features of the myriad of machines on the market is something the buyer has to make, and this indeed I did, after collecting so much information I'm

thinking of setting up a database.

I decided that my machine was the most convenient to operate, after the initial nuisance of recording the announcements.
The question is, is the manufacturer capable of making a machine that does what it was designed to do? I have now had four machines, and each has worked worse than the previous one. Come back, oh First One:

the clicking noise you made is
(almost) forgiven!

I have also had reports of three other machines, which were all faulty as well, I am thinking of

Key concept

integration engineering concept."

And Harlan Mills (the original chief programmer) in the same publication cites an interesting practical example. "A Navy bell-copter/ship system, called LAMPS

Michael Dyer of IBM Federal

offering a prize to any (indepen-dent) person who can show me one of these contraptions that ac-

When those machines

But I haven't updated you on my on-going saga, have, I? I took the first machine (with the maddening clicking noise) back to the shop, where the man said "Oh." He took it away and a week or so

later said, "It has no defect."

Said I, "I know that. How about the newer model which makes less noise?" After some more weeks the shop man came up with one of these. It was indeed quiet enough but did have a defect — it recorded a buzzing

over the message. I took it back. "We'll fix it," he said. He didn't — he gave me another one, and the buzzing on

Thinking that this could go on for ever, I rang up the supplier himself, asking, "Why are your machines so badly made?"

"Nonsense, nonsense," said he, "bring it in." So I brought it in, and to demonstrate the fault, asked the demonstrator girl to of the changes that British Telecom has insisted on for the demonstrate recording the anmachine to be approved have in fact made it work less well.

First 'Ooh, I've never done that,' through in my helpful way. After about an hour of fiddling around a backroom boy announced. "This machine is faulty." Oh, so

ACCORDING to a report in the highly-respected US publication. Business Week, personal computer suppliers have discovered a particularly lucrative market the professional company manage and technician. Still with me, dear readers? They gave me another one (fixing a machine requires knowledge, you see). This has a cracked power supply and the unit itself has all kinds of interesting symptoms: dropouts, flashing error lights, refusals to It could be that it is Business Week which has made the disco-

answer. It has taken me some time to figure out the fault, ery, the personal computer word being closely involved already in the professional user market place. At a recent IDPM Central Lan namely that the pinch roller is out of alignment so it slowly mangles the tane.

don branch meeting, several So what will happen now? I am speakers representing large organ sations stated that neither they may their businesses knew how may I suppose basically the ie is trying to be too clever - that functions as complicated microprocessors were opening within their respective companie. as these cannot be performed reas these cannot listly at this level of the tech-

Perhaps the main factor at vanced for the spread of the care. tive level micro is frustration with the in-house data processing de

FOCUS

Besides being regarded as unre-ponsive to user needs, the trie tional computing service is deemed inflexible and slow in responding to changed circumstances such a new applications or revised

Mandate

If that is the case, the DP team should be thrown out together with the CPU, peripherals and a cilaries rather than bringing in to

dividual processing power.

If the computer team's worked means that line management has seek alternative means of compa-ing support, the DP section would seem to have a clear mandate for ** more funds to meet the necessary

Whether the funds provided as support additional in-house pesonnel or equipment, or just be sufficient to rent computer the and personnel, the DPM should

organise promptly.
It could just be a matter of also cating priorities with payroll, VAT and accounting procedure change ranking high on any activity

programme.

Matters relating to such areas a providing additional management information and statistics or form among my clients.

My experience is that it is very difficult to teach even experienced system planners how to do this by redesign should be assigned low writing or lecturing. It is like learning to drive — you need hands-on experience with an in-

One point seldom made clear it articles and features extelling the use of executive micros is where the individual involved is going to find time to develop his own

It could be that the personal computer world has missed the businessman's bus, with the more ment towards distributed online processing and remote terminals a reacture if not a status symbol on most user management desks.

There is neither a requirement

not space for individual processing units but there does remain a considerable market for the micro at a point where the minicomputer

The small business parmenting company or operation, once excluded from the benefit of computer power, can now be fully independent of shared services.

independent of shared services, bureaux or time-sharing system. It is this market which present most concern to the DP professional. Controls, standards, dependability and servicing are often sparse at best and there is always the danger that the inwary and unprotected buyer could come seriously funstuck.

It is essential that the industry watchdogs, the BCS and NCC assue some guidelines and possibly regulate the proceedings.

Scals of selling approval and codes of buying practice are loss overdue. The BBC is presenting shortly a series on microcomputer called First Bytes. Let us hope that the advice they give will prevail that time business there from get into bitten.

France steps up MPs' information merger computer training

trained in France's elite "grandes 55,000 students concerned, and by écoles", which turn out the country's top men and women for dergraduates in science faculties will be learning about data proces-

> The government computer agency will make 360 computers available to the "grandes écoles" and technology institutes in order to develop instruction in micro-

> this programme will guarantee that France trains enough computer specialists for the 1980s. But they admit that the number of job openings in data processing is impossible to predict, even in the

those in the industry wishing to influence them now have a joint organisation for the exchange of information, following the official merger of the All-Party Commitexhibition on education and training are to be arranged for the spring and summer, and Philippe Dreylus of Cap Gemini Sogeti has agreed to address the group on the controversial issue of how ee on Information Technology MPs and peers) with the Parliamentary Computer Forum (the outsiders' group). The new body, called the Parliamentary Inthe French computer industry compares with the British. formation Technology Commit-tec, is chaired by Ian Lloyd, Tory MP for Havant, and is already

The new name of the group, abbreviated to PITCOM, replaces the less manageable AP-

originally. The committee is keen to emphasise that all aspects of computing are involved, includ-ing robotics and process control, and not just the Department of industry's concerns but those of the DHSS and DES.

Secretaries are Lord Lloyd of Kilgerran and Brian Murphy of ICL. New members are being sought, and those interested should contact Richard Marriott at IBM, Wigmore Street, London.

US computer exports \$6 billion boost

1980, US exports of computers and electronic office equipment machines by \$4.24 billion. Last year's figure was \$4 billion for the

The Computer and Business

elements of other printers. In English, French.

Thanks to our own LSI and microprocessor

technology, the NEC Solnwriter Series 5500:

German, Scandinavian, name it. And one

Impressions. Quietly, quickly.

And that's just for openers.

thimble will last more than 30 million clear

balance for 1980 reaching between CBEMA's 36 member companies (including IBM, Texas Instru-ments, Xerox, Control Data and Digital Equipment Corp) generate three quarters of 1980.

DURING the first nine months of 1980. US exports of computers Equipment Manufacturers Association forecasts the industry trade billion, some 85 per cent of the

The US Bureau of the Census reports that US exports of computers and computer parts totalled \$5.4 billion during the first

GILB'S MYTHODOLOGY

Don't jump — simplify by taking several steps

that design and implementation problems need to be solved all at one time. The ideal of the integrated system which does all tasks is still living in our practices.

We are often forced to break down gigantic undertakings into more modest phases of implementation; but then we seem to do so reluctantly, and with a sense of having been defeated in carrying

I suggest that we adopt a dif-ferent mentality towards system plans. We should recognise that it is often in our interest to divide up a development process into many smaller steps of progress. And we should appland the designers and planners who manage to identity relevant steps, I believe that they are demonstrating greater imagi-nation and talent in their work, while at the same time showing maturity and caution in not trying

while at the same time showing maturity and caution in not trying to accomplish too much at once.

20,000 titles

As a simple example, let me mention a publisher system where we were building up a database which included the products, about 20,000 book tiles in at least eight different languages. We had so classify the book by which land guage it was written in: land in fail work.

Checked that it had functioned accurately, eliminated those classify and curtaily, eliminated those classify and examined the remaining task) and examined the remaining file to determine a promising next programmed scan.

We managed to classify some high percentage perhaps 90% in his manner. The rest were taken in a final manual phase, often reclude this in the database.

It was obvious to us ritat we half averaged to the book in the database.

It was obvious to us ritat we half averaged to classify some high percentage perhaps 90% in this manner. The rest were taken in a final manual phase, often reclude this in the database.

possible word combinations in so many languages. Is a title with ET and TU French or Latin or Norwegian? If we made a mistake on one of the phases, we could easily rectify it without impacting past good work.

cannot be determined by any exa-mination of author and title, and full automation would be an unat-Systems Division (IBM SJ 4/80 p.458) says: "The development of software in increments is a key

One option was to get some people actually to examine the titles and also the actual books, by programming the greater volume. It also seemed that it was of the evolutionary method (as I much easier to do so in a series of have called it in my earlier programs than by trying to design one program that thought about all

Computer theft

Not the Correcter hasn't gape means. There is little point in seeing a computer when, more sanificantly, it can be interested to assist the thief in his aim of specialing the Company translated. In pricably these theorems are average antipoyees with no previous convention the number of Complete resisted fraudists growing tech yes.

What can be come about it?

Surprisingly it is not arrandomatic proposit.

Our next Londom seminal, believed on this training we have strong to the Francia Social and expensionally previously in the head on the realists of internationality in complete the first or internationality in complete the first or internationality in complete the first on the proposition of the propositio

and then to write down a language code on a form for later keying into

the computer.

Another "all at once design" was to imagine this fully automated by some programmed examination of the little content and perhaps the author. Books like Heyerdahl's Kon-Tiki, however, cannot be determined by the perhaps.

tail automation would be an unattainable ideal in any case.

We solved this problem by a
series of about 12 very simple
programs (each written in less than
a day, or less than an hour) which
concentrated on automatic determination of the easy and certain
alternatives. After each phase we
checked that it had functioned accurately, eliminated those classi-

ment: A Practical Technique for Software Development. Using a staps for initial delivery, instead of study of such a development, they Management do need to the delivery. CONFERENCES

WEABLESY Conference Centre in the visite for the Parisher Software Cook for the Parisher III Organises by Historical Parishers, the event by appropriate sponsorable from the Institute of Dead Processing Mathagement, and the Computer Software sponsorable from the Institute of Dead Processing Mathagement, and the Computer Software sponsorable from the Institute of Parisher Software sponsorable for Software sponsorable in attract software instituted in attract software information selections of the Software for information telephone Chris Codingram on 01,584

many, will he held in Cologue from November 44. The event, organized by Destache Telecons, is expected to attract all users of refecommunications systems, private or professional tasters, public authorities, majufacturers and so on. The Under Enhibition for Telecommunications, will be staged with the Convention Peatures will include network diagnosis, telecommunication systems, component parts and modules and wide band communication. This event is being organized by the Cologue Instrumental Trade Fair Company. Further, information is available from Cologue International Trade Fair, Mesugplate, Posifich 210760; D-3000 Köln 21.



baffled as you.

nology. It is also funny that some

ructor beside you. But I hope that this note, on the

simplification principle of

planning many rather than one or a few implementation phases, can be of inspiration and support to those

who wish to follow up this subject

on their own. Evolution beats revolution on all

writings) in an extraordinarily complete and insightful way. They speak, for example, of "the difficulty of doing a good complete project design initiwhole dream project in several years, delayed and well over budget. They want the critical results using a simple approach in the initial implementation? as soon as possible, this year. You can give it to them by imaginative untangling of the rats' nest of complexity which seem to describe many of the large projects, and many small ones, which I see

tial implementation. "As experience was gained by using (the new system) new features were added and old features were modified on the basis of this experience." "Thus user experience played a major role not only in the implementation."

in the implementation but also in the specification.

"The development of a final product which is easily modified is a by-product of the iterative way in which the product is developed."

Space does not permit more than a sampling of the excellent insights and experiences in both the above sources.

was a four-year project of over 200 person-years of effort, developing over three million and integrating over seven million words of program and data for eight different processors.

integrating over seven million words of program and data for eight different processors in 45 incremental deliveries. Every one of those deliveries was on time and under budger."

Basili and Turner; in an article I ecountly unearched in Tokyo, recognised this in December, 1975 (IEEE Trans. of Software Eng., p259) in their Iterative Enhance ment. A Practical Technique for Management do not want the

TEN YEARS AGO

From Computer Weekly of January 28, 1971.

FOUR British software houses Applied Computer Sciences, Business Software Fraciance Programmers, and Programming Sciences International have agreed to form an association to be known as Alfied Software House An Investigant of £700,000 has been made by American Express in Hostyns Group Ltd One-third of the professional staff, numbering about 45, are to be made redundant at 1900 Proprinting UK Ltd Systems international (UK) Ltd has gone international discontinuous and result of the columbary.

bring home the bacon

Using graphics to

HOGGING the keyboard is the latest creature to be compu-terised; a Humberside company called Pigtales is using a microcomputer to provide

WHILE UK training places for

computer programmers and

is embarking on a four-year pro-

gramme to train an extra 600 com-

puter engineers annually and to

include data processing in all uni-

The ministry for universities and the ministry of industry's

computer agency have announce

a 70 million francs programme in-cluding posts for 60 teachers.

The government computer

imy, says 120 of the new engineers instruction. Some 400 microcomand systems analysts will be puters will be ordered to train the

agency's president, Bernard Lor-

versity courses for scientists.

Qualified veterinary surgeon
Bill Miller knows what information pig farmers need, and how to "We have to be practical - the

waterproof, and the output easily read it in the rain and hold it in one hand. That's why we use thick A4 paper.
"We chose the hardware

mostly Tektronix — with desktop graphics in mind, as it's the easiest way to put the results across. The 23 farmers using the ervice send in a pocket diary of data they record every week, and we produce a series of reports. "Most of them used manual

methoda before. This way it's much easier for them to keep rowed in a week, or whether pro-duction is up to target. We get for a large client as well as ex-farmers ringing up asking Can panding its bureau business on to you run, a quick check on my an Alpha Micro 1050;

sows' fertility', and we can do an immediate analytic and diagnos-

industry, business and the Civil Service. The others will graduate

from the universities and institutes

400 micros

All students in the third year of schelor of Science courses will

get basic training in data processing. At present only one science student in 20 obtains this type of

Pigtales updates its records on 5,000 animals every week, using its own database package called Telltales. "The farmers don't all but they all want to be able to record anything they want. Once we had made that possible for pig-farmers, we found we had a piece of general software on our hands, and we intend to sell it to other Tektronix users", said

Miller learnt about statistics and computing while doing a post-graduate course on public health at Minnesota, and he was quick to see the potential for

Pigtales was started 18 months ago by Miller and a couple of colleagues with experience in pig-

farming.
About half its clients are local, with the rest scattered from Pen-zahee to North Yorks. The comtrack of how many sows have far- pany has two full-time employees

T-A runs into a loss

TRIUMPH ADI Fig. West Get.

man parent company of Adler
Business, Systems, expects to
record a loss for 1980 mainly because of the costs incirred by its
US subsidiary, Royal Business
Machines, in setting up a marks, well up on the 1979 gurdof 1.2 billion. Financial results for
1980 will be published by T. A in
April

Machines, in setting up a marks
keting operation for word processors and deaktop computers.

A Triumph-Adler spokesman at
the company's Nuremberg headquarters refused to comment on
reports that turnover in
marks, well up on the 1979 ggurdof 1.2 billion. Financial results for
1980 will be published by T. A in
April

Merged with T. A in 1977 Royal

Merged with T. A in 1977 Royal

Merged with T. A in 1977 Royal

as best known as a typewriter
supplier. The company also sold
calculators and copiers. In 1980.

Royal spent a lot of money acquiring agencies to handle the TA 1600

as the Bittle. The latter is built in
Burope by T. A but was designed
in the 1990 will be published by T. A in
April

Merged with T. A in 1977 Royal

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calculators and copiers. In 1980

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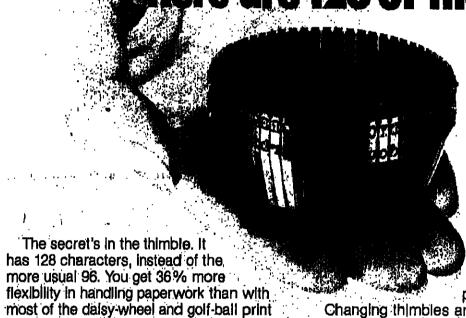
supplier. The company also sold
calculators. In 1980

calculators. In 1980

A Triumph-Adler spokesman at
the company also sold
calculators. In 1980

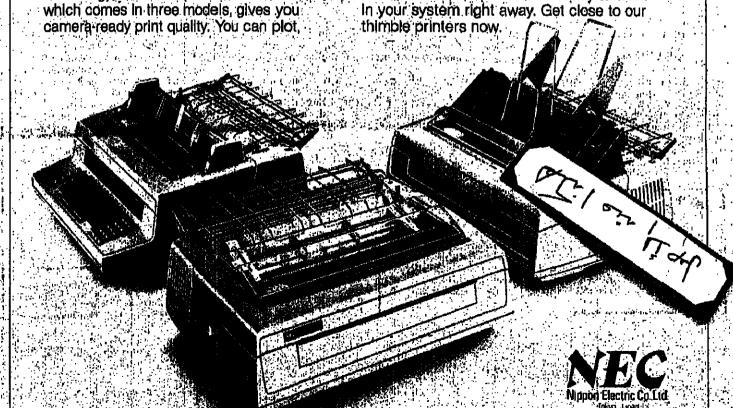
calc

You have every reason in the world to switch to NEC's "thimble" printers. Liere are 128 of them.



graph, superscript. subscript. Tab horizontally or vertically. And print bidirectionally.

Changing thimbles and ribbons is a snap. Also, system modularity means your Series 5500 printer will grow as your requirements grow. And one of the nicest things about it all is that it really won't cost you a thing to switch. 7 Interface capabilities, including those for Diablo, QUME and Centronics, means the NEC Spinwriter is ready to work. In your system right away. Get close to our



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guidance of the UK electronics in-dustry compares unfavourably

with that given by its chief compe-

titors - Japan, the US, France and West Germany.

At its first meeting, the restruc-tured Economic Development

Committee (EDC) for electronics

agreed that there is considerable

scope for changing present policy within UK industry and govern-

ment. These main changes of

policy are likely to be implemented

in the form of co-ordinated

national R&D and marketing stra-

Japan, West Germany, France and the US all experience faster

growth in the electronics industry

points out, there are several strik-ing similarities between their poli-

EDC appears to be "co-ordina-tion". In each of the competitors'

policies a single institution develops policies, assesses priorities

and implements them over long

The key word singled out by the

UK can learn from

rivals in govt aid to

Communications boost for IBM small systems

BINARY synchronous commu-nications for the System 38, im-proved Systems Network Archi-its customers, outlining plans for tecture support for applications further communications capabili-programs on Series 1, and 3270 ties for the System 38 over the next emulation on the 5280 distributed clutch of new products announced last week by IBM's General Systems Division (CW, January

The BSC support on System 38 will be available by April, 1982. It will enable the machine to communicate over telephone lines with 370, 4300 and 30XX mainframes, with Systems 3, 32, 34 and other System 38s and with the Series 1 and the 5110/5120 desk top machines. It can also link up with a variety of terminals, including the 5280, 5230, 5260 and 3741, but

the System 38 has now been moved forward to April this year. Other new facilities for System 38 include several programmer productivity aids, incorporating a leature called Screen Design Aid (SDA), for generating application

Series I enables applications programs under either the RPS or EDX operating systems to communicate with a CICS or IMS apartment of the control of the contr plication on the remote host. three years, IBM promised that it Another new communications prowould add BSC Multi-Leaving Reduct is the Communications Monimote Job Entry, BSC Multipoint Tributary Connection, and tor, a licensed program product that manages communications Systems Network Architecture between two Series Is, between a Remote Job Entry (SRJE), in each case to a 370, 4300 or 30XX host. Series 1 and other computers, and between Series 1 and various I/O The start of SNA support for

Now phototypeset directly from your computer or word processor.

IBM has also jumped on the local "ring" bandwagon, albeit in a limited way, with the Local Communications Controller. It takes the form of a single PC card added to each Series 1 and enables up to 16 of them to be interconnected in a "ring" with full difference of the state of th

IBM explains that each Series I can direct messages to any other Series I unit in the "ring" without the need for a master controlling

Each Series 1 can selectively broadcast to any or all of the other Series 1 units, by means of user-

The 5280 distribution data system can now appear to a remote host as a 3270 controller in either a BSC or SNA environment. Operations supported include batch a "ring", with full duplex trans-mission at up to two megabits per either BSC or SNSDLC.

Thomson-CSF begins production of household computers

THOMSON-CSF is to begin manufacturer says it is confident it can snatch sales from Sharp, Matsushita, Communitation of personal computers at retail prices ranging from Sharp, Matsushita, Commodure and Apple thanks to its line, central France, at the end of the consumer in Prance is going to have a name: Thomson." Thomson-CSF's chairman,

There's a whole world of

difference between photo-

EditWriter range

Without rekeyboarding:

virtually every word processor or computer.

going to have a name: Thomson." Wahlain said the Thomson

viewdata-type data banks, plan home budgers and be geared to function with France's future

printer terminal manufacturing business with the launch of the 2510 series of high speed matrix units. They compete directly with printers like the Texas Instruments 820 and the Tally T1612.

Digi-Data is seeking UK distributors for the 1510 terminals because end user sales are expected to account for a puch higher to account for a much higher proportion of shipments than with controller products. The first to be signed up is Dicoll Blectronics of Basingstoke, best known as a supplier of systems based on the Digital Equipment LSI-11. Two more distributors are being

first printer terminal WELL-ESTABLISHED as a supplier of magnetic peripherals, initiated ninemonic command for Digi-Data has moved into the formatting features like margin and tabs, horizontal and verical

Digi-Data sees lightness and compactness as two of the min

attractions of its Model 1516 printer terminal, shown here have used the said measures 21.9 x 18.5 x 8.5 inches.

Digi-Data launches its

150 and 200 chps printing speed achieving throughputs between 39 and 250 lpm and a maximum base rate of 19.2K-baud. An option extended buffer can hold a full 30 character by 25-line screen.

The 1510 family comprises to models at the moment, the 2% KSR version which costs £1.29 at £1,070.

Manufacture of the 1510 tent Digital Equipment LSI-11. Two nore distributors are being ought.

An interesting aspect of the 1510

Yorkshire Bank orders De la Rue cash dispensers

TO speed up customer service, the Yorkshire Bank Group has placed an initial order with De la Rue for 10 of its new 1320 teller assist cash dispensers. The 1320 operates in stand-alone mode and enables a cashier to dispense any mix of up to four note denominations. It also prints a record of all transactions.

The microprocessor-based 1320 can be tailored to suit the requirements of individual banks including data recording, cashier identification, customer account

grand totalling of dispenses A keyboard terminal on the count displays messages to guide the

De la Rue is well established the cash dispenser business is supplies mechanisms on an ORM basis to manufacturers of through the-wall units like NCR and De

Teller assist systems like the 1320 are designed to speed up the cashing of cheques by cashiers.

Measuring up to DP

THE Prench Thomson group's TITN company has added to its activities the production and marketing of measurement data

processing systems.

TiTN is challenging the dominant role on the European market of the US firm, Tesdata. Its target is a 100 million franc (about 194,582) turnover by 1983. Be-

tween 25% and 30% would be rived from exports.

It sees a big market shead for in DPMS 1000 centralised meteorology system which links measure equipment by telephone lines.

The DPMS 1000 makes possible worldwide weather forecasting by

GREATER **MANCHESTER POLICE**

ostable. Greater Manchester Police, Computer Project B Park Training School, Prestwich, Manchester M25 81

DHMAND over took supply a about \$450 million.
Christmas in the elegaronic toy and game business, but the boom is not likely to last, according to industry studies.

From 1977 to 1978, US sales of electronic toys, and games in creased five times over, while roun 1978 to 1979 they tripled in the period 1979 to 1980, sales were expected to double but they have increased by only 10 to 20% to

electronics, says EDC search. On the equipment user

> European policies differ because up to now they have been designed to encourage existing firms within existing constraints. In particular, Japanese policies have always aimed to promote common technological targets through co-opera-

side, awareness is promoted. The EDC points out that the more co-ordinated this promotion is, the

By sharing application and use of basic technologies, the Japanese have managed to avoid intense internal competition and concentrate on competing with the US in an effort to close the technological than the UK, and, as the EDC gap.

No conflict

The Japanese have been successful in the electronics and many other industries because no conflict exists between the aims of national policy and the aims of in-dustry. The EDC points out that Japan has a market economy rather than a "planned" economy; hence the government merely guides and assists.

Research and development is promoted by this institution, but a rational Trade and Industry also sensibly shared out. For example, only a limited number of firms guides the electronics industry without funding. Its total funding

Japanese build trial GaAs computer unit

GALLIUM arsenide (GaAs) large scale integration devices have been developed by scientists of the Japanese Ministry of International Trade and Industry, using a new method which has facilitated the mplementation of such devices

within a trial computer unit.
The research team of the Electrotechnical Laboratory, Agency of Industrial Science and Technology, has built the trial computer unit using line geometry of three microns: It comprises 11 elements and can achieve speeds of 120 picoseconds per element with a power consumption of 10-12

Unlike silicon devices, gallium arsenide elements are suited to superfast computers, because of their high operating speed and low power consumption. Up to now, application in computer systems has been limited because of manu-

The new method developed by the research team involved the application of a special Schottky cffect junction to replace existing bulky, power-consuming Level-Shift circuitry. The gallium arsenide semiconductor used was the Normally-On type which required connections between each pair of connections between each pair of clements to control their voltage

The team considers that if the trial computer unit is taken down to one micron dimensions or less it will be possible to get down to speeds of 50 picoseconds, maybe 20 or 30, and a reduced power consumption of a few milliWatts.

An official programme to develop such a computer is planned this spring by the Ministry of In-ternational Trade and Industry.

The company claims that Har-

mony can save a designer between 40 minutes and two hours of each

Voice control in VLSI design

A VOICE recognition module called Harmony has been designed

called Haymony has been designed for use with a very large scale integrated (VLSI) circuit designing system.

US company Calma, based in the silicon valley, developed Harmony to give the user voice control of a computer system.

The voice tectignition modified attaches to the company's vector attaches to the company's vector memory display rerminal, which in turn connects to and controls the operation of Calma's Graphic Display System II, a computer recorded and stored from the user of specify characters and this is time constituing. Harmony has a 100-word vocabulary of commands which it can bulary of commands which it can be user to specify characters and this is time constituing. Harmony has a 100-word vocabulary of commands which it can be user to specify the user to specify characters and this is time constituing. Harmony has a 100-word vocabulary of commands which it can be user to specify the user to specif

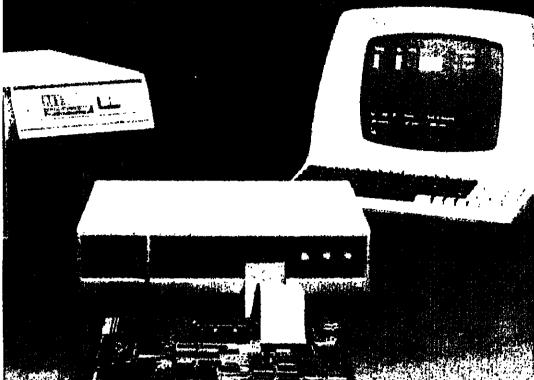
Toy boom on the decline

new technology is bought at the

lowest price possible by the most

suitable company, thus ensuring an efficient policy.
The EDC indicated that the UK should be setting up co-ordinated projects involving major UK and Plessey, in the same way as the Japanese have done both with LSI and VLSI circuits. These companies could then bear the cost of a centrally co-ordinated research

Representatives of electronics companies on the committee, which includes Ferranti, Thorn-EMI, Philips Industries, STC, Racal Electronics, Plessey, GEC, and the Post Office appear



Zilog's ZSCAN 8000 development system operates with a host computer to provide amulation the company's 16-bit microprocessor the Z8000, it can also act as a stand-alone system.

National's ADD-IN memory board: for PDP-11 Computers: The NS11E featuring our ECC correction code eliminates mistakes quicker than they're made. What's more, your operating process won't be interrupted.

NS11E offers a memory capacity of 128 KByte (64x26). The newly developed correction procedure checks every single Byte but won't lose speed in the process. Moreover, it works with only a single 5 will supply current (The NS11E fits into the PDP 11/04, 34, 40, 44)

The National Offensive for the 80s.

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word processors and computer systems to our Compugraphic

Itel is bankrupt but the problems still linger on . . .

ITEL CORP went to the Federal Court in San Francisco on January bankruptcy under Chapter XI of the Federal Bankruptcy Act. Itel, sonce the king of the compu-ter lessors, was insolvent.

With debts of \$1.6 billion and assets on its books valued at \$1.1 billion, the company faces a very difficult time. Even though present management entered bank-ruptcy voluntarily, hoping to use certain your loss to protect Itel as it attempts to reorganise, many difficulties make the situation uncomfortable for a large number of indi-

viduals and organisations.

The shareholders are obviously affected. So are the banks that loaned Itel money; the insurers, principally Lldyd's of London, that backed some of Itel's deals; and the users of equipment leased from Itel, who now face additional difficulties if they had hoped to return equipment under special provisions of Itel leases.

Itel's fortunes had risen rapidly during the middle of the last decade, with sales and profits peak-ing at nearly \$700 million and \$50 million respectively in 1978. But in 1979, in the wake of the announcement of IBM's 4300 series computers, data processing equip-ment in Itel's portfolio and the IBM-compatible machines it was selling became drugs on the mar-

Income fell, profits turned to losses and the company's executives, for whom winning had become a way of life, turned into big

Acrimony

The controversy surrounding the company will not be cleared up in the near term. Investigation and lawsuits, revisions of the company's accounts, disputes with customers, lenders and insurers, actinony among past and present executives all make explanations of what happened clusive. But some of the facts are now known and more will emerge from the struggle that is underway.

The evidence points to bad dgment, at the very least; Computers were the cornerstone

equipment that had a high price-tag. The computer business pro-vided the cash that could be used

short terms would not be renewed.

The insurance was important be-cause the financing of the lease 19. The matter was routine, as the law goes, but it was unusual in the computer business. Itel filed for lease a fee for its services as packager –middleman – was added to Itel's war chest.

No matter that some of the leasing deals later had problems — as

Debacle

Impressed by Itel's scemingly golden touch, financial institutions of all sizes put money into the hands of the company's managers, expecting their funds to be re-turned, with interest or dividends ded, and never expecting a debacle like the one that has ensued.

In addition to some \$440 million now outstanding on loans secured by assets, Itel has debts of \$860 million that are backed by nothing but the hopes of the present cor-porate leadership under James H. Maloon, who once ran Pan Ameri-can Airways.

There are other liabilities in addition to these debts, including some \$300 million in so-called contingent liabilities, funds that might be needed for attorneys and the repair or maintenance of machinery in Itel's portfolio.

And there are reserves against the possibility that insurance on certain computer leases, most of it underwritten by Lloyd's of Lon-don, will not pay off Itel's claims

In regard to that insurance, Itel said, in its recent financial reports, that it expects claims against Lloyd's policies to exceed \$300 million. Lloyd's will not comment on the validity of its claims other than to point out that Itel's estimates and those of underwriters may be the object of a difference in

Lloyd's insured the computer leases of more than a dozen other companies and expects claims payments to come to something

It may be a few years before anyone knows just what the total insurance losses will be, and the public may never be informed.

The losses at Lloyd's stem from a series of reblicles that have been

a series of policies that have been labelled "J" policies because they are written on what is called a "J" form. In essence, Illoyd's insured various computer lessors against what the laborate particular actions.

cause the financing of the lease equipment was based on long-term rentals of the equipment, whether

Deals

As things turned out, many users did not elect to hold leased equipment for the full terms of agreements. Instead, they chose to terminate their leases as provided by their contracts. When they terminated, the rentals on the computers and peripherals were lower than originally anticipated, so Itel and other lessors were forced to offer extensions of the leases at very low rates in order to

This decline in the market value of equipment led to claims against Lloyd's, which led to losses far in excess of the premiums paid for the insurance.

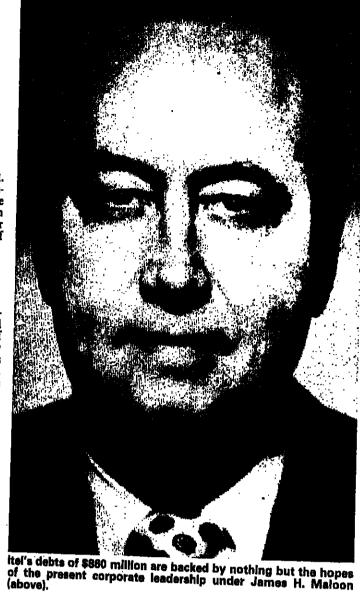
The insurance was the reason banks loaned money for the pur-chase of the computer in the first place. Under the terms of Itel cases, the risks involved for the lender were very great compared to those permitted under Regulainsurance presumably eliminating the risk to lenders, shifting it to Lloyd's, bankers went for the kinds of deals Itel put together.

The users signed contracts the

The users signed contracts that, for the most part, involved termi-nation after four of the seven years. But in the contracts were provisions that in fact obligated the lessees for the full seven years in the event Itel could not find other ways to make the machines Lloyd's, for any reason, did not

Lump sum

In a sense, there were two arrangements made almulatneously. One was a clear hell-or-high-water obligation on the part of the lessee to pay off the lessed computer. The other was a set of promises, insured by Lloyd's, that were supposed to relieve the initial lessee of obligations if the computer



half of Itel's insured leases have been brought to some state of negotiated settlement by this time.

Typically, Lloyd's will make a lump sum payment to the computer user in return for the user's signing an agreement that removes Itel and Lloyd's from any future obligation. The user's requirements to make monthly payments under the lease remain untouched. The user then ends up with the computer for the remainder of the full term, typically seven years, but with money from Lloyd's (and, less often, Itel) to partially or fully cover the cost of future

payments.
Some lessees are still using these machines, while others, who have accepted the fact of their obligations are still using the second tion, are physically keeping the machines but unplugging them to save on maintenance as they move forward from the 370 generation to newer machines. No two situations

seem to be exactly the same.
Lloyd's is continuing to work with lessees of insured machines, even though there is a provision in Computers were the cornerations are written on what is called a "J" was returned.

of Itel's business, which also inform. In essence, Illoyd's insured As users have terminated, shipping containers, railcars what the insurer perceived as the tried to reach realistic comprosing a serve to only the insurer's obligation.

But the tone of the discussions could well change, as Lloyd's may be acting as much out of a sense of dence, only a lack of foresight.

honour as of legal obligation these

Itel, for its part, must come up with a reorganisation plan. It is due within 120 days of the filing of bankruptcy papers. The plan must be approved by creditors repre-senting the majority of debt.

senting the majority of debt.

There are, according to Itel, some 6,000 creditors, of which some 100 are considered principal lenders. After failing to reach some accord before going bankrupt, Itel's prospects for settlement may be only a little better now.

The bankrupter enables Itel to

The bankruptcy enables Itel to cease paying interest on loans and that cost the company \$150 million in 1980. The law also blocks demands from creditors for what they think is due to them.

The company says it expects its container and railcar business make money, thus giving Itel a chance to emerge from bankruptcy at some future date. But for now, with a negative net worth of over \$260 million, the situation is hardly inspiring of confidence.

puter with 120K-bytes of main the more of the vocabulary of shoulding some of the vocabulary of shoulding strings of syllables, by the fact that word boundaries are one indicated in the string of syllables of shoulding some of a proper name in the dictionary in the comment of a proper name in the dictionary in the string of syllables and sometimes by the absence of a proper name in the dictionary in the string of syllables and sometimes by the absence of a proper name in the dictionary in the string of syllables and sometimes by the absence of a proper name in the dictionary in the dictionary in the string of syllables are considered in the string of syllables and sometimes by the absence of a proper name in the dictionary in the dictionary in the string of syllables are considered in the string of syllables are considered on the syllables often makes the substitute on to see the word of syllables often makes the substitute of the sylvaniary and the latest of the sylvaniary and the latest of the sylvaniary and the sylvaniary a

only one cause of inaccuracy with techniques were to become was sold main systems. Lindon Thomas, who

Viewdata software for V77 minis

NEWS IN BRI

PRIVATE viewdata softwart run on Univac V77 series mink been developed by London be. Detweiler-Thomas, a system house specialising in real mark plications. Univac is to market system, which is proved. system, which is priced in £14,000 for a 16-port 10,000 to version based on a 1,000-port pre based on four V77/200 plus based on four V77/200 plus into a V77/800. nto a V77/800. Protocols have also been

veloped for the mini to from ICL, IBM or Burrough at

Australia enters **VLSI stakes**

THE Australian government venturing into very large solitegrated circuit research for a first time under the directional Craig Mudge, who headed a VLSI design team at Div.
Equipment in the US.
The project, which is parties

computing research division of a Scientific and Industrial Research Organisation, is to receive a z tial funding from the Austria government of \$1.5 million.

EEC to use **CII-HB** software

UNDER a service contract tween Honeywell Bull (Behn) and the EEC, CII-Honeyn. Bull's Mistral software will be The service, which has be

operating with CII-HB's list will in 1982 use a DPS 7/82. ht... be publicly available throught. ronet. The target date is a 1982, with only limited seems

Better NPNs

IMPROVEMENTS in perfer ance and density of NPN bight transistors to suit particular W. npplications, have been annound by IBM. Researchers at the Ell Thomas J. Watson Researchers in Yorktown Heights, And Centre in Yorktown Heights, And Thomas J. York have developed an emis-mental structure using a new big lar technology that can switch approximately 100 picoseconds.

Printer plant BURROUGHS is to build 1 158,000 square foot centre if 0.

system on show in UK lando, Plorida, for designing at manufacturing what are destrib as "advanced computer prior devices", including non-land STANDARD Telephones and Cables has run demonstrations this week designed to convince British Telecom and UK tele-Shorthand speech translation usefulness of a 10-year-old teleconferencing system made in the US; which is claimed to be able to handle a virtually un-limited number of participants.

Equipment now used by British Telecom is limited to eight stations inland and five internationally, while STC plans to such as the Telenote telewriter demonstrate a 20-station international conference from its Encounter the attached.

Business sats to

BENTON: British Telecom played a

cluding the capacity leased from the French satellite Telecom 1, and British Telecom's share of the

Tariffs will be independent

distance. They have yet to be finalised, but will vary with trans-

mission speed, whether the link is full-time or part-time and whether

the capacity is pre-assigned or

Talks are under way with five or

six potential customers and a user

group is to be set up soon, but they find it hard to investigate applica-

tions without knowing the tariffs, while British Telecom finds it hard

to set tariffs with no estimate of

as great a variety of options as pos-sible and to respond quickly to the way customers see their needs.

British Telecom claims to have

costs will be £8 million.

taken at short notice.

be no cheaper

PRIVATELY-LEASED satellite

communications links in Europe

will be more expensive than all but

the longest terrestrial leased lines,

According to British Telecom.

Managing director Peter Benton said last week that the private satellite-based links to be offered to

companies as a result of last

month's Eutelsat agreement would

satisfy an urgent need for links that could be expanded and redis-tributed rapidly, but for most pur-poses they would be replaced by

terrestrial links with the build-up

of the Integrated Services Digital

Network on which System X would be based.

The first digital private circuits are to be made available during 1983 between 30 of the largest towns in the UK as each section of

the digital trunk network is put

The satellite links are due

start up during the same year, fol-lowing commercial trials planned for this autumn using the Orbital Test Satellite which is already in

space, and will be developed alongside a Europe-wide terrestrial ISDN increasingly based on opti-

cal fibres.
Offering a choice of transmission speeds up to 2Mbps, the satel-

lite services are also seen as com-

switched services which offer

speeds up to 48 Kbps. The interna-tional ISDN will use cable, line-of-sight radio and both big-dish and

small-dish satellite links as appro-

Terrestrial links are likely to predominate, since they will be more economical by the early 1990s, but if the expected growth

rates are attained more satellites will be added to the five currently

Two mobile earth stations have

already been ordered from Fer-ranti for the trials this year, and between 20 and 30 are to be Rutelsat, who last year were split

between 20 and 30 are to be ordered for the full service in 1983 between the European Communications Satellite programme,

Plessey at a cost of about £5 milion. The satellites themselves are expected to cost £50 million, in-

'Unlimited' teleconferencing

proval for operation of the system on leased lines and is ex-pected to add switched network

approval shortly.

Made in the US by Darome of Harvard, Illinois, the system consists of a conference bridge called the Meet-Me and a conference terminal for each site called the Convener, to which

Burroughs \$68m loss

• From front page

delivery backlog was at an all-time high.

Blumenthal said the drop in profits related to restructuring, and basically represented a "deferral of revenue to future periods."

He explained that the booking of sales had been slowed by a change in delivery strategy which involved putting machines into local "staging areas" for assembly and test before delivery. The staging areas are one of the company's not committed as yet. He revealed that two new 900 series machines support which Blumenthal recogusesures to improve service and that two new 900 series support which Blumenthal recognizer coming sout

nised as Burroughs' biggest prob-



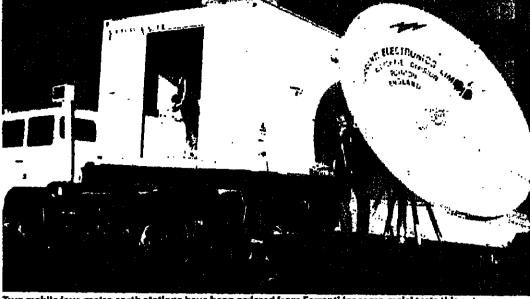
Multiple Access with Telecom 1.

£250,000 and FDMA stations less tions, for use in point-tomultipoint links, cost even less and should there be many applications for this type of link, this is where satellites will enjoy the greatest ad-



12 to 14GHz transponders suitable or small-dish services are to be added to all but the first of the five ECS satellites, while the use of the ECS and the Telecom 1 systems together gives both greater geo-graphical coverage - from the Shetlands to Gibraltar, and from Sweden to Greece - and a wider choice of facilities, using either the cheaper Frequency Division Multiple Access method with ECS or the more flexible Time Division

TDMA earth stations cost about



Two mobile four-metre earth stations have been ordered from Ferranti for commercial tests this autum

IBM services now available from Scicon

IBM users are now offered APL, tion. The IBM services will in-PL/1, Cobol and Portran facilities clude local and remote batch as v Scicon Computer Services. The Milton Keynes bureau has installed an IBM 4341 operating under VM/CMS and VSI which can be accessed where possible via the network that serves Scicon's well-established and very extensive Univac 1100-based bureau opera-

The two-megabyte 4341 was originally intended to run the infoline information retrieval service on behalf of Pergamon Press. Pergamon bought Infoline from its previous owners, which included

echnology, UK fraining Chairman: Andrew Colin, University of Strethetydo, UK Chairman: Andrew Colin, University of Strethetydo, UK

Smannash: Arkirew John, University of Straticiyad, Ul A self-training course in micronrocessor-based produ W S Matheson & C A Microca, Opén University, UK A microprocessor learning system A Singar, E&L Instruments, USA Effective use of microcomputers in schools J I Tunbult, National Computing Centre, UK

gain University A review of the felicit hardware and software developments Microcompulars for the businessman Microcompulars for the businessman Microcompulars Selemograph Services

Guidekhas for the businessman planning to "go it alone" with a called like and technical use of microcomputers with a called like Figory, Research Machines Limited.

The midro is having a growing impact on the research laboratory alternocomputers and the Professions with a called like and the professions. The professions are taken as the professions are taken as the professions are taken as the professions.

of micros

Setting up a school computing department

Mike Bawtes, Royal Grammar School, Guildford

Guidelines on surficulum development and teacher training

Computer stood learning—a practical propedition

Or Dignet Lauritans, Institute for Educational Technology, Surrey

University

or sugner, quantiers, institute for Educational Technology, Swarey University: Micros alle reditions the dost of tombuler aided learning ' lighe insignative use of inferecomputers' Terer Lebris, Editor, Practical Computing Itaphias; modelling, elmulation, networking — the sky's the limit for nicro applications.

<u>FRIDAY 13 MARCH</u>

public money on an unsuccessful retrieval software development (CW, July 3). But the deal between Scicon and Pergamon fell through in November. According to Scicon, this was mainly because of Pergamon's tardiness in select-

March 11, 12 & 13, 1981 — Wembley Conference Centre, London

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D Dunlop, Zicig, UK
An approach to special-purpose multi-microprocessor systems
IR Whitworth, Royal Mittery College of Science, UK
Development Bystams
Onstrman: David Dack, Hewlett-Packard, UK
A low ocotasel contained support system for the Intel 2820
I Werdle, A Karlan & D J Quarmby, Loughborough University of
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Developing FORT-BAN program sulles for microcomputers
C Queres, Systematics, UK

The CPIM operating system — the software bus D Powys-Lybbs, MML Ltd, UK

THURSDAY 12 MARCH

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sequential microprocessor.

Amoromana alructure R. Oriega & y Espino, CIEA IPN, Mexico

SUPER MICRO puter with 120K-bytes of main memory 40K for the translation WITH DISK DATA CACHE 28000 16 bit processor: ● Z8000 16 bit processor ● 256k bytes memory ● 500k bytes memory ■ 18m bytes Winchester disk ■ 10m bytes Winchester disk Mag Tape Back Up. 4 user Unix v7 ligence C FASCAIII 28000 Assembler May Tage Back up List user tight v7 licetics: C. PASCAL 28000 Assembler C. PASCAL 28000 Assembler ALBO FORTRAN COBOLE BASIC * Full range of VDU's and printers * Piping Josi Ahrismanis Manager Propagation Systems Late Community Systems Late Community Systems Late Community House Control Shows Community House Control Shows Control Control Shows Control Control Shows Control Cont

by Pamela Rowe

Hoskyns beats the recession

HOSKYNS GROUP, the company founded by John Hoskyns, now the Prime Minister's adviser the company's pre-tax profits against History that the

CGS spreads its wings with big US consultancy

FRENCH software giant Cap Gemini Sogeti has acquired a firm footing in the US with the purchase of Milwaukee-based DASD Corp. The move follows last week's expansion into the Norwegian market with the acquisition of Data Logic (CW, Jan 22).

At the same time CGS has broken off the long-standing licensing agreement with the US software products firm ADR so that it can concentrate on its own product

concentrate on its own product

Since the licence still had two years to run, ADR has acquired Cap Sogeti Products, part of the CGS group, as its outlet in France, to be called Applied Data Research, France

scarch, France.

CGS results this year mean that the company can afford to grow, especially on foreign ground.

"What DASD can give us is a wide network of branches in the US" explained CGS chairman Philippe Dreyfus. "Also its business is essentially in the private sector—industry, banking and commerce." industry, banking and commerce - whereas our work in the US up to now has been in the public sec-

CGS already has an office in Washington of some 30 consultants concentrating on federal and

price Scicon paid for System

Control recently. administrative projects.

"It takes a long time to grow abroad when you are based on home ground" said Dreyfus, "As it is we now have a ready made force of 500. We could have waited to years to grow from 30-bittons to Control recently.

The move away from ADR is linked with CGS wider ambitions.

"For 10 years we have been acting as a sales outlet for US products" said Dreyfus, "and it means that we but a great deal of ducts said Dreyfus, "and it means that we put a great deal of management and sales effort into selling produce that contributes in little to our income, and nothing to our own technical development."

CGS will be exporting its own 10 years to grow from 30-strong to

A new branch of Cap Sogeti
Logiciel is opening in Boston to
sell products.
DASD, one of the most prestigious consultance approach

CGS will be exporting its own software and what it calls "hard-computerised aid for the profile interrogation software SYSIP for IBM-based mainframes, its automatic text composer A DOC tigious consultancy operations in the US was ranked second after the US was ranked second after c
1BM in a recent brand preference F
study conducted by Datamation.
The DASD Corp employs about
500 people across the US, with
the majority of its offices concen-500 people across the US, with automatic text composer A DOC trated on the Rastern scaboard and its portable high level ian in the mid-west.

With total revenues last year of CAP's MicroCobol but based on a subset of PL/1.

Memorex tumbles

now the Prime Minister's adviser on strategy, reports turnover for the year ended October, 1980 up nearly 50%, from £12,096,697 to £17,686,624. Profit is up from £643,000 pre-tax in 1978-79 to 5.32% last year, to 7.09% this year, still almost a percentage point below the industry median for last year (7.49%) In Item 1881 year (7.49%).

Hoskyns, now part of Martin
Marietta Data Systems, claims that
much of the improvement is a paymuch of the improvement is a pay-

DREYFUS . . . "DASD can give us a wide network of branches in US."

\$900,000 the acquisition of DASD

will provide a substantial addition to revenue and profit for the CGS

ICL, Fujitsu fight it out Down Under

once the exclusive preserve of ICL, is now the scene of a major confrontation between that com-pany and Japanese giant Pujitsu. Fujitsu has beaten ICL to the

strength of sterling.

Unlike many other companiesreporting recently, Feeney makes no formal complaint about higher

interest rates which have cost the

company £103,000 this year,

According to the company, the

worst of the recession appears to

be over and Hoskyns is going into

1981 with one of the strongest

against £20,000 last year.

post for a series of Australian public authority open tender

business is expected to move to Rurope this year and the trading results for the two companies in Australia last year clearly show how the battle has gone. First, the ICL results: For the

year ended September 1980 International Computers (Australia) Pty reported a profit of A\$137,129, against a loss of A\$160,894 the previous year. Turnover was up 28% to A\$67.5 million from just under A\$50 million in 1979. Stan Owens, head of ICL's

turn to profit was achieved despite a loss on foreign exchange of A\$1.74 million. This compares with a loss in 1979 of over A\$4 million on currency transactions. Owens observed that the

strength of sterling had added appreciably to product costs. However, the company ended the year with a record order book, including the first 2966 sale.

In the consolidated report for the ICL group the Australian figures are hidden in the turnover for the Australasia and Asia re-

gion. On this basis the Australian operation contributes just under 50% of the turnover for an area which takes in New Zealand, Hong Kong, Malaysia, India, Singapore and agencies and dealers

Australian subsidiary's with DASD, CAP Gemini accomplished a range of software packages including program conversion as software, one of DASD's software packages apecialisations. Turnover up 550% Turnover up 550% FASCOM (Australia) Pty, the Furcher plum of the /

No price was quoted for the DASD acquisition, but about \$10 million would be in line with the PASCOM (Australia) Pty, the Fu-jitsu marketing subsidiary in Aus-tralia reported a 550% increase in turnover, from A\$8,000,000 in 1978/79 to A\$43,000,000 for 1979/80. The company has moved into profit for the first time since setting up in Australia in 1972, with a modest A\$10,000 profit for 1979/80 against a loss of A\$4.000.000 in 1978/70 and A\$4,000,000 in 1978/79 and accumulated losses of A\$13,000,000

mulated losses of A\$15,000,000 Problems of the spectacular turnround was achieved primarily through the successful selling of 21 of its medium-sized F model systems, the equivalent of the IBM 4300 and the ICL 2900 series.

Australia, Fascom also captured the plum of the Australian computer market last year when it sold to the Bureau of Statistics two M200 machines worth a total of A\$9.5

According to the company it sold its machines in 11 out of 17 open bids where the user changed

According to Mike Roydon,
Fascom managing director, the
company increased its staff over
the year from 150 to 260, giving
gross sales per employee of
A\$165,000. This is substantially
better than many community better than many companies operating in the UK achieve. The The company appears to have achieved a major breakthrough at the upper end of the market where it sold an Amdahl V7B to Esso ployee in 1980.

COMPANY COMMENT

THE results of ICL Australia and of Pulitsu's marketing subsidiary there, make sombre reading.

MBMORHX, which has reported manufacturing elements of losses of \$26 million on sales of Memorek into one single division of 1980, is back in the kind of infancial crisis it faced only up the Business Systems Division seven years ago.

According to industry commendators in the US. the base charies Fascom has increased its market share substantially primarily at the expense of ICL though obviously not without inflicting losses on IBM.

Although Fulltau likes to stress the facilities available on its machines; the real battle is based on price. For any given machine it is estimated that Fullitan will provide a system of similar power for about one-third of the IBM or ICL price.

sevent years ago. In 1973 it loss over 500 million In 1973 it los

Logabax hires 20 more dealers

WITH its French parent company just saved from bankruptcy (CW, December 11, 1980) Logabax in the UK has announced that it is doubling its external sales network y hiring an additional 20 dealers. hey will handle the firm's small business system range.

To reinforce its dealer network, Logabax is also setting up four dealer support teams to cover the whole of the UK and the Irish Republic.

The existing 15 dealers selling

the Logabax LX2000 small business system and LX500 personal computer accounted for almost 35% of Logobax's turnover for the products during 1980.

The rescue operation for Loga-bax in France has involved major injections of cash, including about £12 million from Electrobel of Belgium, which has increased its controlling share in the firm to

Two other sources which have already contributed about £21/2 million, and are each expected to and a similar amount in the spring, are the French nationalised banks and the government investment body, CIASI.

Another £21/2 million is being put in by the group set up early in 1980 to take over Logabax. The hree members are banking giant Société Générale, aviation conglomerate Marcel Dassault, and Dassault's computer and electronics side, Interrechnique,

which leads the group.

After going off the idea of a Logabax acquisition late last year and so plunging the company into crisis, intertechnique finally agreed,

Signal merger complete

MEMORY maker Ampex has completed its merger with Signal and is now a wholly-owned subsidiary. Signal, a conglomorate with widely diversifed interests, had turnover of \$4 billion last year, compared with Ampex's \$469 milus a prerequisite for the plan, to pay £11 million by a 65% holding in the smaller and peripherals, manuser. The one big condition at 1 Logabas should perform that ter this year than in [890].

Electrobel is keen to dope its majority interest in Lopke But so far, the redundant the Logabax manufacturage tion in France seen as prosen-improve the comes prosenimprove the company's fine have not materialised. Whit presidential election on it months away the French grament would be relucant by prove any cuts in the provenance. prove any cuts in the Lan workforce

According to Logabar and IFF85 million cash injections the existing interested prospected for April, bringstotal contributed to the Logabar and the Logabar an

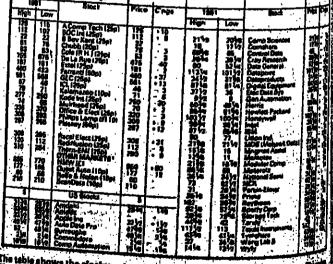
Prices will stay 'soft'

INTEL, the world's lace microprocessor chip product, announced turnover for the a ended December 31 up 29% tr \$661 million in 1979, to \$88a lion in 1980. Profit rose 286a \$77 million to \$96 million.
In the fourth quarter there

slight drop in profit come with the carlier part of theyer.
Gordon E. Moore, the in chairman, said there was imprice decline in the second like the year, and he expects post stay "soft" until the ross? . ends.

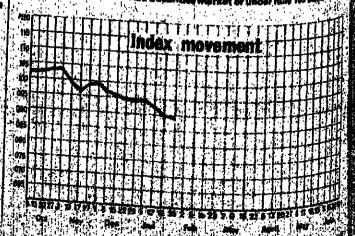
Profits doubled

MINIDISC maker System in ries Inc., which recently went quarter revenues for 1980 5041: at \$9.9 million. Profit at doubled, from \$249,000: \$482,000.



The table shows the closing prices in London on Fridey and in America of District the share index is based on the prices of the UK companies in the table light of Lows have been adjusted where necessary.

Shares design, in the Unlisted Securities Market or under fluis 161 (2)(4).



PROGRAMMERS' PAGE

Computers find a role in films, music and art

up all the time in your average wide field and has ranged from mobiles made from paperclips to bievele tracks across virgin paper. So harnessing the ubiquitous com-puter to the Cause is, dare I say it, ogical enough.

In the early computer days there were many claims of how machines could be programmed to compose symphonics, write best-sellers, and even, given the (im)pertinent lata, to out-Picasso the Cubists.

Results were disappointing, though. The sheer ponderousness of the task, to program even an outline figure, was not realised and styles were wooden and predictable - which was perhaps

The situation today, just as full of possibilities, is more realistic, with the computer used as the tool of a creative human. Given the decreasing costs of hardware and increasingly easy-to-use software, computer art is booming among film-makers, composers, and art-

Arts Society

The Computer Arts Society was formed in 1968 as a specialist group within the British Computer Society. It aims to encourage the creative use of computers and has a worldwide membership of 600, with 300 in the UK and the remainder divided about equally between the US and the world. Be sides the London branch in Russell Square there are two others, in Paris, and in Michigan. Secretary of CAS, John Lans

down explained to me that the major artistic contribution of the computer is to graphics and electronic music. Computer generated graphics are used extensively animation, for films and commercials - indeed, it has now become so expensive to produce hand-drawn cartoons that 20% of all animation in the US is carried out via the computer.

"Given enough money," he said, "any image can be synthe-sised."

One artist at present in the US is Tony Longson on a Bicentennial Arts fellowship in California, He has used computers in his work since 1973 and specialises in threedimensional shapes made of images printed on layers of clear perspex. As the viewer moves, the shapes change and evolve into dif-ferent forms — Longson describes them as "drawings in space,"

Planets:

He is also fascinated by pictures of planets, and his fellowship for-tunately takes him to the Jet Propulsion Laboratory in Pasadena. Here computers fabricate pictures, composed of an array of tiny units, from signals sent back by space vehicles. Each unit can be defined by colour, size, etc. and controlled in the final image. Longson has had several exhibitions, including two in the US in 1979, and one last year in Oxford.

Working in Britain, on a Science Research grant at Leicester Polytechnic, are Britest Edmonds and Stephen Scrivener. They have been experimenting with raster images which not only.

Puzzler

NO doubt you're looking for something to work out on that new pooket calculator you had for Christmas— so try this one. The task is to identify the three different digits involved. See page 45 for solution.

X,YXZ = X×+ YY + X×+ Z*

cribe the image as a matrix of points, each with a particular sound descending from the high pitched continuous tone of the value, that can be stored in a special section of memory. Writing to the memory reproduces the Principal Curve, to the calmer image, while reading allows lower notes of the glissando and

The plus factor of the matrix system is that the image maps directly on to its representation the computer in effect "looks at" the image on the screen.

In the more conventional vector system the image is held as a list of vector points, so is only a representation of an abstract structure. The user, at one step removed, does not have direct access to the image but must learn to manipulate the abstract to affect the representa-

without his hat. The hat can be removed with an ERASE command, stored actually on the edge of the screen, and recovered with a COPY. A cursor used in conjunction with FILL would block in any desired part of him, and can be stopped when his flesh becomes

that bit too solid. Edmonds and Scrivener are now They aim to write procedures that will translate the perspective in herent in two-dimensional pic tures, into new images, taking into account the figure/ground

Acceptable

perception and perspective is Dr Chris French of UMIST, Manchester. He made a fairly light hearted investigation into whether computer art is a load of set rolling by an Alan Parkin arti cle on computer plotting of illumi-nated balls, given details of size, position and direction of illuminaion, Chris French bounced up one better by rewriting the routine in Fortran IV, and modifying the light to a point instead of a parallel source - it gives a more artistic effect.

Some of his effects are illus-trated. The centre-piece shows a helix of balls turned around to expose the central tunnel; Bottom right, another double helix of balls is printed to overlap each other's positions in space.

Chris French believes that computers will take over from the spray-can and graffiti-covered wall, as the time honoured tool for expressing creativity. They will soon be within the reach of everyone's pocket, he says, and are slightly more socially acceptable a

···· Harmonics

part in two ways. It can be used to aid composition by controlling synthesis and harmonics, or as a device to produce sounds directly. Control is practised mostly in UK and Europe, while production is more common in the US.

The internationally known com-poser, Kenakis produces clouds of amorphous sound, by using the computer to calculate the probabi-lities of sharmonics. Berno Amman, the notable Swiss conductor and composer, turned to electronic, music in his Sixtles after a distin-guished lifetime in music, and has collaborated with universities in Europe and America.

Top right of the montage is an excerpt from his "Splendeurs Noctumes", produced in 1975/76 using a PDP-15. Amman, by recourse to logarithms, generated 12 phases constituting the 12 steps of

One of the most significant contributions to computer music has been made by the British-based Electronic Music Studios. Besides carrying off the first prize in 1975 for the world's best computer they have a whole list of achieve-

ments dating back to 1967. Musys is a series of programs designed to process sounds, dealing with scientific as well as musical aspects. It was written aspects. It was written mainly in Fortran by Alan Sutcliffe, though Peter Grogono wrote

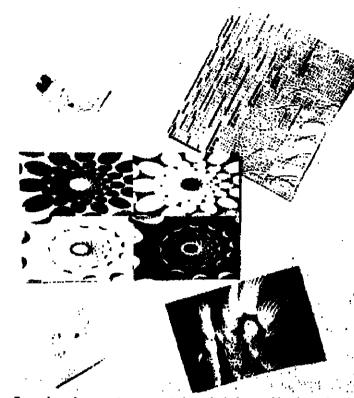
A forthcoming week of seminars and concerts on the theme of "The

puter compositions. It is planned with two sets of concerts and a presentation of tape-works giving in overview of computer music.

To spread the word and further zine, Page, issued four times a year, and holds meetings in Lon-don on the first Monday of each month. Membership, running from January to December, costs £4 and includes copies of Page.

Each year CAS elects an outstanding services to creative computing. Last year it was James Blinn, who produced the compu-

Computer art and music are settling in well. All that's needed now is the best-seller.



Examples of computer generated art include grap sequences, printout of data defined chains of bal electronic music score.

For around £20K, you could have any of the many 16-bit computers on the market.

For around £20K, you could have only one 32-bit computer. Ours.

Our new Concept/32 has two things in common with a 16-bit computer. It is roughly the same size and roughly the same price, The rest of it is light years away.

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LSI chips, multiwire boards and the fact that it is compatible at source with the 32 series software means greater reliability and reduced programming and support costs. It can be used with a wide

range of peripherals including a new floppy disc arive and a 32MB cartridge disc drive — and, being modular, can be easily

integrated as a component within a system or a

There is no 32-bit computer to touch it for price and compactness. There is no lothit is recomputer to touch it for performance.

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fulsome account of the remarkable new Concept/32 from Systems.

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How many ops are to the manner born?

- or did you just become one?

It may be misleading to put the alternative as starkly as that. After all you probably have the kind of abilities which suit the way you earn your money — and if you haven't it's time to avoid an ulcer

and collect your cards. But which way does the balance tip? Is there something ingrained in you which particularly suits your way of life, or did you stum-ble to your present eminence through your own efforts plus the movement of time and chance?

Nature or nurture

The conundrum of whether person's fate is determined bynature or nurture has been a preoccupation ever since mankind first

Interviewers selecting the right bod for the right job don't usually arbitrary. The value of an aptitude test lies in its trustworthiness as a have the time for such preoccupa- predictor. tions and cut through the philosophising. They want to know if the interviewee can do the job and then to predict the way the person in the chair is likely to behave.

There are, of course, many ways for an employer to fill a vacancy, ranging from old boy networks to. ever else you care to think of, then skill in leapfrogging or tiddlywinking would be acceptable predictors for aspiring shrinks. 'O' levels and

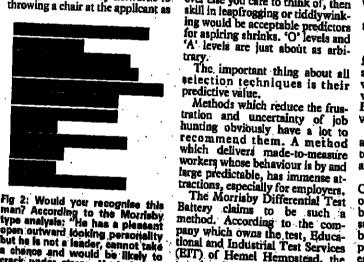


Fig 2: Would you recognise this man? According to the Morrisby type analysis: "He has a pleasant open outward looking personality but he is not a leader, cannot take a change and would be likely to crack under strees. He lacks the specialised ability that analyse film to absorb book knowledge and reproduce it in an exam."

he or she walks into the room. It's been done and is a method of judg-

selection, favoured throughout DP, is the aptitude test. The approach of such tests usually equates to the kind of things candi-

arbitrary. The value of an aptitude have.

Por example, if a significant proportion of psychiatrists happened to have an aptitude for least to the company when he was responsible for computer was responsible for computer was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for computer the test to the company when he was responsible for the company

selection techniques is their predictive value.

Methods which reduce the frustration and uncertainty of job hunting obviously have a lot to recommend them. A method which deliver made to restant. It was clitic hard most that

Arbitrary

leapfrog or tiddlywinks or what-

'A' levels are just about as arbi-

which delivers made-to-measure

workers whose behaviour is by and

(RIT) of Hemel Hempstead, the

test gives "a complete statement in objective terms of the intellectual

"structure" of a person, "it describes the mentality of the person

A high success rate is meant to ing how people react to a surprise.

More definite than that, it's an infallible way of seeing how they'll behave when a chair is thrown at can be made, not only of the per-son's likelihood of success in a very A more measured aid to his expected mode of behaviour in large number of jobs, but also of a wide variety of real life situa-

cquates to the kind of things candidates will be doing, but the essence of the aptitude test is that, like the

Fig 1: Completion of chains like this, which was originally orange and purple, is the first part of the Morrisby Differential Test Battery.

chair throwing, it can be entirely how an individual is likely to be-

"It isn't just another aptitude test", says Brian Harrington. "It is a predictor." Harrington is currently Data Base Administrator at

training and is a firm believer in its

took it before Christmas.

How does it work?

He administered the test when I

The entire battery of tests lasts for three and a half hours with a

short break in the middle. I sat it

answered 12 pencil and paper type tests. It was quite hard work, but

absorbing and enjoyable.

The first test, the co-called Compound Series Test, consisted of continuing strings of coloured beads, as illustrated in Fig 1. The subject has to choose which two beads, from eight to earther the continuing strings of coloured beads, from eight to earther the coloured beads.

beads, from eight, to continue the pattern. There are 60 such sequences to complete and although the

first few are easy, the latter are all

A high success rate is meant to measure the capacity to learn by understanding as distinct from the ability to learn by memory.

Operators who have been persuaded they are thickes should ake heart from the assessment that a score of four on the Compound Series Test indicates suffi-

a number of advantages for the

first test in the battery. Colour weak individuals - those who are

not completely colour blind -

usually have no problems because

the colours have been arranged to

grasped the nettle of cultural bias

and a dependence on socially acquired skills. The company even

laims that the test can be used on "primitive people". Presumably whole tribes can be lined up in their mud huts or huddled into a

Following the understanding/ memory test are three general ability tests covering verbal, numerical and perceptual skills. Results from

these are designed to be used as a

matched trio determining suitabil-

ity to one career or another. Por

example a "biological science

Speed

As with the rest of the test, BIT does not encourage results of the general ability probe to be ana-lysed in isolation. The significance

wadi to be tested.

Most important, EIT has

Fig 3: An EIT survey of 300 clients provides the substance

between skills and aptitudes. The relationship between results is drawn up to form a personality profile in the kind of histogram shown in Fig 2.

Decreaser

Labour

The first section of the Morrisby test is used to give an indication of ability or, to take the language of astrologers, the head. The remaining tests are taken to indicate heart or drive and comprise a shapes test, a mechanical ability test and then a clutch of six speed tests. The speed tests are supposed to

define personality and dexterity.

The final histogram or profile is said to remain the same in its pattern throughout a person's life.

Harrington argues the test on to a scientific basis by saying: "In effect we're conducting an experi-ment. The criterion should be re-

peatable and if that is so, we have a predictor." Taking the line of thought to its conclusion he says:
"If we have a predictor it gives us significant control."

Explosive

Byery effort is made to keep the criterion repeatable. The tester works to a script, and control is kept at a maximum with each part of the test strictly timed. Hi'l insists that before anyone is alluwed to administer the test, they must attend a five-day training course.

If a test like this is accepted as a profile" shows a person to be "suited to medicine, dentistry, some types of nursing, zoology and agriculture".

If a test like this is accepted as a predictor then, says Harrington, it gives us significant control. The issue of control is explosive, as Harrington is quick to acknow-What we have here," he says, "is a loaded gun."

However, before anyone gets hot under the collar about control, the validity of the test must be determined.

Validity in this case is a two-specied animal. There is academic validity based on statistics and close scrutiny, and the rule of thumb "I've-scen-it-work" kind of validity.

Mary Morrisby, a psychologist by training, knows that the "prob-lem of getting statistical figures is

great". She continues: "Validity figures is She continues: "Validity figures can be misleading because people tend to use precise techniques on litose data."

The only validation work referred to in the brochures describing the tests is summed up in Fig. 3. The histogram is "based on the findings of 300 industrial organisations".

it is true that exhaustive statistical analysis is a large task, but the pragmatic vehicity test would represent a total cop-out to an academic psychologist working to a tighter frame of reference. The data for such a validation check must be available because tha test was completed in 1955 and is an by something like 15,000 people every year.

Hire and fire

Top appointment at Commodore

PEOPLE and EVENTS

A PRESIDENT and chief operating officer has been appointed at Commodure. He is James Finke, who joins the company from Data General, where he

Finke gained a physics degree from Williams College in 1951, and received a master's degree from Oxford Univer-Between 1974 and 1978, Finke became general manager of General Electric Medical Division's internasity in international economics. He also tional operations.
Initial responsibility in his new job gained a law degree from Hervard Uni-

national operations in the company's semiconductor division, he rose

through the organisation to become vice-president and general manager of

10 years in the computer industry specialising in the development of high

by Don

NEEDLE ...

says Finke, will be in ensuring that Commudore's marketing principles are applied effectively to "a promising US market." His career in the computer industry hegan in 1964 when he joined Motorola. Starting as director of inter-

John Hutchinson, former lecturer in computer science at Queen Mary Col-lege has been appointed company secretary at 21st Computer Systems. Another director appointed by the company is John Reynolds, who after Richard Emery has been appointed senior systems analyst at Microfin Systems. He was previously with John Lewis Partnership. Jane Collins has also joined the firm as marketing

Reg Broughton has been appointed national marketing manager at Wang UK. He joined the company three years ago and served most recently as field sales manager.

Mike Burden, who was behind the launch of the Wordplex word processing bureaux, is leaving the company to become managing director at Computer Ancillary Services Ltd (CAL). Ulf Gustavsen has been appointed managing director of Norsk Data. He was formerly international marketing and sales director at Comtec.

Liveware File IT HAD TO COME, I ... THAT CAN BANCE SUPPOSE - "THE ON THE POINT OF A



HAS BEEN COMPUTED





DIARY

System X. BCS Bast Anglian branch. Eastern Electricity Central Ac-counting Offices, Russell Road, Ips-wich. 7.00.

FEBRUARY 3 Ada/Pascal, BCS Kent branch. Kings Head Hotel, High Street, Rochester. 7.30.
Technical update - hardware. BCS
North West London. Railway Hotel,
Greenford, Middlesex. 7.45.

FEBRUARY 4
Visit to Artificial Intelligence Department, University of Edinburgh.
BCS Edinburgh branch. 5.30.

Mainframe versus mini, BCS Cheser and North Wales branch. Halfway House, Connah's Quay. 7:30.

Local medical computing the introduction of networking, BCS Dundee branch. Ninewells Hospital and Medical School, Dundee, 7:00.

Ada programme support devices.

Ada programming support environ-ment. BCS North Staffs branch. Com-puter Centre, North Staffs Polytech-nic, Stafford, 8.00.

FEBRUARY 9

Visit to Robinson's Brewery. BCS
Manchester branch. Unicorn Brewery,
Lower Hillgate. Stockport. 6.15. Apply to A. Park on (061) 872 2494.

Visit to British Rail Technical
Centre, Derby. BCS Process Control
Group. Numbers limited, so apply to
Peter Andow, Chemical Engineering
Dept., Loughborough University,
Loughborough, Leicestersture.

ERREUTARY 16

Microprocessors — the State of the Microprocessors — the State of the Art. IDPM Hull branch. Hull Crest Hotel, Ferriby High Road, North Ferriby, North Humberside. 7.15.

Will tomorrow's office be an office? BCS Reading branch. Small Physics Lecture Theatte, JJ Thompson Building, Whiteknights, Shinfield Road, Reading. 3.00.

FEBRUARY 11

The Crest system. BCS Bristol

branch, St Vincent Rocks Hotel, Clifton, 7,15.
Organisation and operation of a DP area, BCS Hampshire branch, Pottsmouth Polytechnic, Pottsmouth

5.00.
The office of the future — beyond word processing. BGS Kingston-upon-Thames branch, Room 140 Kingston Polytechnic, Penrhyn Road, Kingston 7.30,
Computers in banking, BCS New-castle-upon-Tyne branch. Billson Bullding, Newsatla Polytechnic.

FEBRUARY 10

The Electronic Office, BCS Merseyside branch, Faculty of Science Lecture Theatre; Liverpool University
6.00

Planned maintenance of factory plant BCS Birmingham branch, wheatsheaf Hofel, Covenitry Road, Sheldon, 6.30.

Computer aided design at Fords.

BCS North London branch. West Lodge Park Hotel, Cockfosters, London, 7.45;

Joint meeting with BCS South Reserving and Insurance Institute of Chelmstord. Datel Communications services and Prestel, County Hotel, Chempoters and the public library.

Chempoters and Park Hotel, Communications services and Prestel, County Hotel, Chempoters and the public library.

BCS North London branch. West Lodge Park Hotel, Cockfosters, London, 7.45;

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Chempoters and London branch. West Lodge Park Hotel, Cockfosters, London, 7.45;

Joint meeting with BCS South Reserving and Insurance Institute of Chelmstord. Datel Communications Services and Prestel, County Hotel, Chempoters and Insurance Institute of Chelmstord. Park Hotel, Communications Services and Prestel, County Hotel, Chempoters and Insurance Institute of Chempoters and Insurance Insuran

Systems training head retires from Civil Service Civil Service, Cecil Marks is to retire at the end of this month. A founder member of the BCS, he was involved in setting up specialist groups, and was BCS president in 1975/76. In 1955 he joined a group of people working on electical mechanisation at NPL. He managed the first government DP installation at Ches-

Prestel loses deputy director

ONE month after the confirmation of Prestel International as a permanent service. Prestel's deputy director Mike Ford, who was in charge of the international side, has been promoted out of the Prestel organisation. He is now chairman of British Telecom's Wales and The Marches Regional Board.

Bruce Everiss (left), general manager of Microdigital, congratulates John Bennison of Birmingham on winning the company's £1,000 competition. Entrants were asked to put in order 12 reasons why people should buy from Microdigital. The competition was judged by Everiss and Dr Martin Beer of Liverpool University. Bennison is a fecturer in data processing at Warley College of Technology, Sandwell, West Midlands. Microdigital has recently been taken over by the Lasky's chain and is opening microdepartments within Lasky's hi-fi shops, with launches scheduled for the early part of this year. tor and general manager of Alimand Computer Systems. He was previously with CMC Computer Management Group for eight years as managing director of its specialist banking ser-

FOLLOWING a 43-year career in the sington in 1957, and subsequently was responsible for the Prism Personnel Information System. For the last three years he has been director of systems

training at the Civil Service College.
He will continue his work with the BCS, particularly as co-ordinator for various projects the society is planning for its silver jubice year, which begins

garet Joachim has also joined the com-pany as API, consultant. She viously worked for BCK. Datasolve writing APL Software. Also joining Sharp as a consultant is Nicola Coyne,

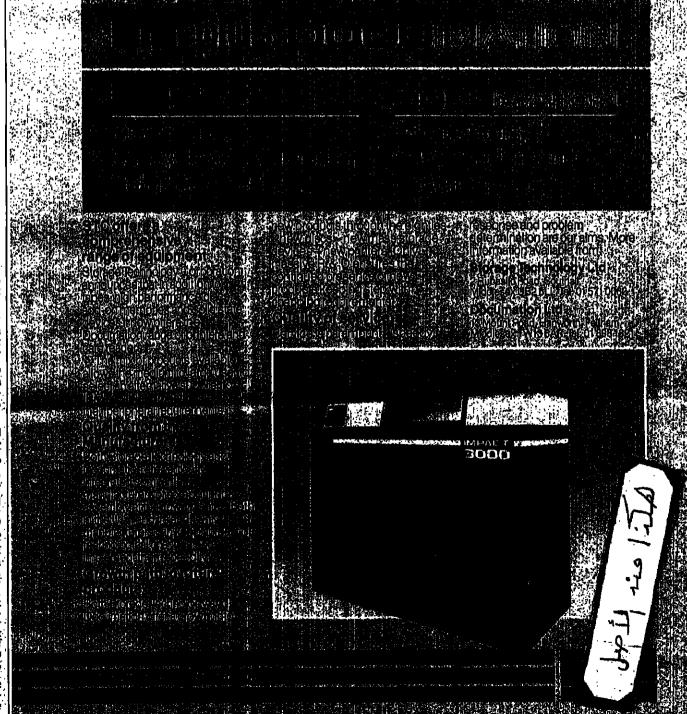
who formerly worked as a student for BOC Datasolve. Raymond Sparrow has joined Butel as systems director of Butel Itusiness Systems. He was formerly senior con-sultant with Logica's Middle East

Roger Willink has joined I.P. Sharp associates as trained consultant. Mor-

Eric Sidebotham, managing direc-tor of PPD Engineering, has been elected chairman of the Control and Automation Manufacturers Associa-tion (CAMA).

Roy Wenving has been appointed nauliant at Systems Resources. He joins the company from Rockwell Thompson.

Some simple addition



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objective terms of the intellectual and modal (personality) structure Mary Morrisby, whose husband devised the tests, says that not one

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Harrington says that at Berger they wouldn't first anyone can the season of rosains but that it does after being decisions. If a unique to the season of the

I WAS phoned last well gentleman asking: "Her a does Computer Weeky a A simple answer spage mind, as did a batch of his

Who wrote Beethorn's Symphony?
Where was the Battle of b

ings?
Who is the Queen Mar Who is buried in Grant's

What time does the 4.34 What do computer out

someone without using thets!

Mary Morrisby says: Tk: formation the test gives st which you'd find out sign months anyway. It doesn't information which isn't do vable." What it does gress mingly definite information qualities like "drive dence flexibility."

Although the histogram's scientific, the language sold describe the lines someway all the precision of a horoway.

I was told, for example, was "more at home with identify with practical matters". - but had I been told heapen I would probably also her concurred.

I would feel uneasy if I will ing hired or promoted on the big Rejection or acceptance of the sweeping techniques as the string risby Differential Test definition

must eventually centre management one believes in people a management of the contract of the c definition or whether mi with fined. Those are the two com of the argument.
The greater the trust plants

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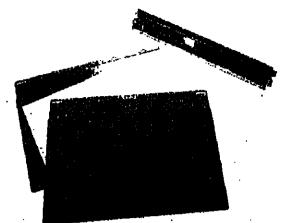
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He says: "After the large sales is cleaning certificants at the large sales is cleaning certificants at the large sales is cleaning certificants.

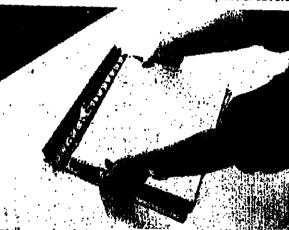
As ideal for wearing a sales across seedlings."

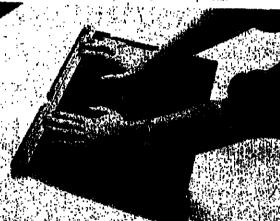
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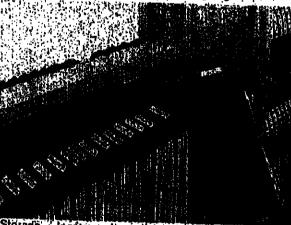


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Storage - locate on hanger bar with one hand. Deak top models through to locking cabinets available.

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1

1981 Wrunt Line Squash Tournament -DRAW FOR ROUND ONE-

Round ONE must be played between 1st February and 31st March Round TWO must be played between 1st May and 15th June 1981 Round THREE must be played between 1st and 31st July 1981

Round THREE must be played between 1st and 31st July 1981
Round FOUR must be played between 1st and 10th Nov. 1981
Round FIVE must be played between 1st and 10th Nov. 1981
Round SIX must be played between 20th and 30th Nov. 1981
OUARTER-FINALS must be played between 7th and
15th Dec. 1981
Note: All the above dates are inclusive. The SEMI-FINALS and FINAL will be played in London on 15th and 16th January 1982.

The draw for the SECOND ROUND will be published in April.
The draw for the THIRD ROUND will be published towards the

The draw for the FOURTH ROUND ONWARD will be published
The draw for the FOURTH ROUND ONWARD will be published
serly in September.
The response to the 1981 Wright Line Squash Tournament has
been so great that the Carter-Pairstt Group decided to waive the
original limitation of 256 teams. However, entries had to be
closed on 31st December 1980 which was the published final

All players and supporters are wished good sport and good luck thy The Wilght Line Division of

TOURNAMENT

Product to eliminate the 'Ooops' factor CICS performance

ager, BGS Systems of Waltham, Massachusetts, believes there is a gap - now plugged by

its newly released product Crystal.

Crystal is aimed at eliminating what BGS calls the "Ooops" factor — that period during the project where everything is rescheduled because there have been miscalculations about such elements as response time. This can lead to long delays while more equipment is ordered, and programs redesigned or

its customers - like removing TP interfaces and so limiting options - that in the US would land it in

front of a Grand Jury in an anti-

So said Sid Green, managing director of Southampton's rapidly expanding systems house Gresham

Computer Services, which is deter-

mined to give ICL customers more options than they are used to when it comes to TP on 2900s.

He emphasised to his audience
— who had come along for a
demonstration of Gresham's

TP2900 teleprocessing support package - that he did not want to cross swords with ICL as other

ICL-compatible systems houses have been known to do.

TP2900 has been developed using ICL's own standard software. It provides a powerful range of facilities which are very much

geared towards the end user, giv-

ing him extra options which are

aimed at ironing out those smal

but infuriating snarl-ups that eat

Attention to detail means that

users can redirect resources when

Getting close

SYSTEM 2000/80, Intel's multi-

user facility for use with the VM/CMS operating system, is

close to release, having passed site-testing at a client installa-tion. System 2000 is aimed parti-

cularly at the IBM 4300 market

to provide support to an online production environment.

up time in the operations room.

ing a performance model to be run through another performance evaluation package, software structure and sets out to estimate res-ponse times, workloads, CPU and I/O time, and memory requirements.

Initially the estimates are rough, but, says

TP system. The basic TP2900 costs £10,000, plus individual subsystems (£1,500-£1,600 is

Gresham installs the system in three days, with two weeks' "hand-holding" and provides a

comprehensive support service

site, after the first year.

BGS, still enough of a guide to point out the larger blunders. As development proceeds, the estimates can be replaced by actual figures and the predictions made by Crystal become correspondingly reliable.

'More TP options

working from a set of tables in core which are used to define parame-ters for the handling of messages

control functions (such features as message logging and privacy

control), application functions (message editing/validation file access and failure handling), secur-

ity and recovery functions, and support functions, including on-line management and development aids which allow supervision and standardisation of programs.

TP2900 interfaces with the Total or IDMS databases. There was particular interest shown in

the security, support and mainten-

Head of management services at Lancing Bagnall, Steve Dowling, gave a user's opinion of TP2900.

The development aids have

played a large part for Lancing Bagnall which is in the forklift

truck business, and has its systems development team working flat out to get them ready for when the brakes come off the economy.

Dowling admitted that online

maintenance could be a double-edged sword, and also that it was

necessary to have one central per-

son whose main function was controlling the TP functions.

Given that, he felt that the speed of

development and operational performance more than justified the decision to trust Gresham.

Gresham emphasises that users should adjust to VME/B or

VME/K methods before consid-

for ICL clients'

The input required by Crystal is a descrip-tion of the proposed application, its anticipated workload, and the hardware on which it is to

BGS, which specialises in performance measurement, provides two other performance products: the interactive performance prediction tool BEST I and the interface with IBM's RMF/SMF which processes measurement data, CAPTURE/MVS.

Crystal, which is said to execute on any system supporting ANSI Fortran IV, will be available from February, for \$17,600.

For patients in intensive care

monitor for DOS/VS

A CICS performance monitor for use in a DOS/VS environment has been released by the Candle Corp in California. OMEGAMON CICS is a real time monitor which aims to make up for the scarcity of CICS tuning experts by winkling out problems in response times, lockouts and system resources.

Candle says that Omegamon can be installed in 20 minutes or less, needing "no hooks or authorised

on a CRT which can be used as a UICS transaction or on a dedicated 3270, which is not subject to CIC! An introductory price of \$4,900

for permanent licence is available to DOS VS users of CICS; the normal price is \$7,500, and the pro duct is available on trial for \$100. The first deliveries are scheduled

'Swap shop' offers compiler for Forth micro language

MEDICAL software specialist Medicom has released a tool for the Commodore Pet which enables nurses to monitor fluid levels of patients in intensive care. The fluid monitor can handle two patients at once. sation which exists to provide a "swap shop" for owners of 380Z Research Machines is offering a The system includes a digitiser compiler for the expandable micro pad which gives a record of the

language Forth.
The Forth compiler includes all various levels printed, displayed or in graph form. Including digitiser pad, cas-sette deck and software it costs the low-resolution graphics rou-tines and debugging facilities, and comes with a comprehensive

the Research Muchines User

tion of RMLug, and can supply the Forth compiler for £100. RMLug exists partly to distrividual users.

Williams can be contacted at 35 St Julians Road, St Albans, Herts.

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It's called INFO - a very high-level language, aiready in use in hundreds of installations worldwide.

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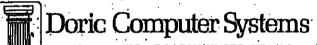
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Entries are now open for COMPUTASTARS Computastars 1981 — and for the Computatug special

road . . . The time has come again stamina in an effort to find the best will take part, will be in Holland in the computer industry to don their the computer industry the computer industry to don the computer industry to don the computer industry to don their the computer industry the computer industry the computer industry to don the computer industry the com

As with previous Computastars, individual talent will be given recognition and to provide flexibility within the competition at regio-nal heats and finals, events may

> First UK heat will be for the Midlands region in Birmingham on April 25. The Southern heat will be held in Barnet on May 16 and the North gets its turn in

Finals will be in July at a date and venue yet to be announced. European finals, in which the top

Companies may enter one men's or one women's team or both, although additional teams may be entered in other regional heats. Acceptance of teams per region will be limited to 35 teams per heat, so it's first come, first served.

Closing date for entries is February 28 and the entry fee is £25

At the foot of the page there are two entry forms. The first is for Computastars, the second for this year's special tug-of-war event.

Computer Weekly and Wright Air Conditioning.

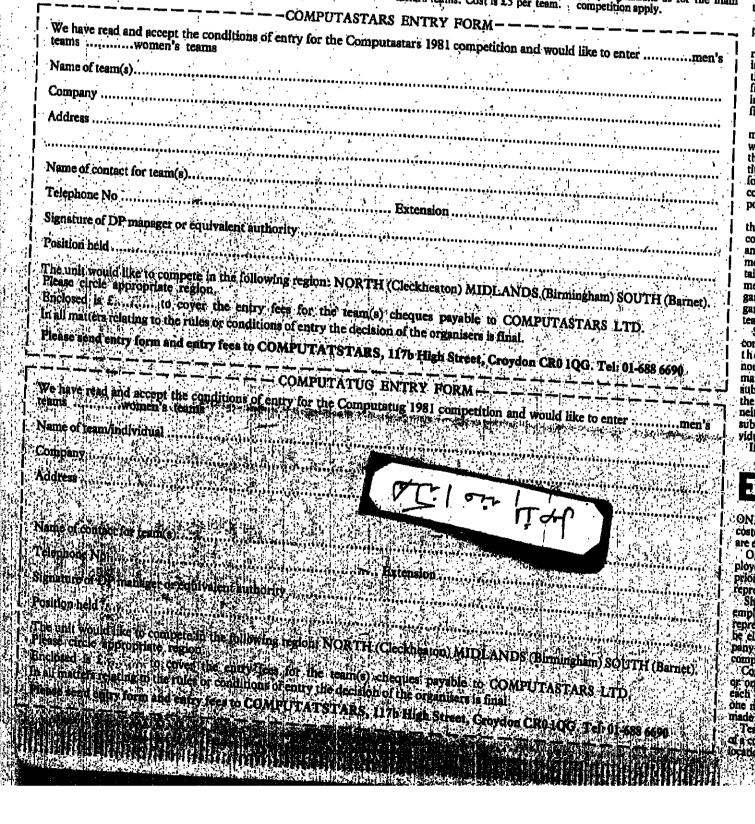


COMPUTASTARS is a popular event and consequently attracts many enquiries. If you have a query, please don't contact us at Computer Weekly — get in touch with the staff at Computastars, 117b High Street, Croydon, Telephone 01-

Only the strong need apply

By way of a change, an additional competition is being held this year, the Computating. An opportunity to prove superstrength, this tug-of-war is open both to teams of five women but men and teams of five women, but not to those competing in Compu-tastars teams. Cost is £5 per team.

recommend it! Same rules and eli-







Johan Brouwer, of Digital Equipment, demonstrates his skill in the football dribbling relay at last year's Computastars.

Ground rules of the competition

TEAMS will consist of not less not take part in the remainder of the competition. This rule will also people. Each team is required to

nominate a No. 1 competitor who will, as well as being a member of the team, compete for the indi-vidual title. The competition will be run in

two sections - men and women. Teams will compete in regional

The winning teams from each region will be invited to participate in the national finals. The top three men's and women's teams from the national finals will be invited to participate in European finals in Holland in September.

Bach team must provide marshal – not a team member who may be required to assist in the smooth running of the competition. Failure to provide a marshal for each round in which a team competes will result in penalty points being deducted.

In each event in each round three members of the team will compete - the nominated No. 1 and any two of the remaining team members selected by the team captain. Team captains must be a member of the team, and with regard to team selection etc, the organisers will only recognise the

ganisers will only recognise the team captain's selection.

Should the No. 1 be unable to compete after being nominated, then the team captain will nominate a substitute from the renominate a substitute from the remaining team members. If the substitute for a No. I is used after the competition has started, then neither the original No. I nor the substitute is eligible for the individual title. yidual title.
If a No, I is substituted he

apply to the nominated substitute.
Failure to comply with the

nomination of teams and the rules of substitution will result in in mediate disqualification. The competition will normally

consist of eight events. These will be selected from the following types of events, which apply to both men and women.

1. Running events - any distance up to a maximum of 800 yards per individual and may is 2. Throwing events - with a range from a cricket/hockey bill

up to a competition weight shot. Basket or netball type skills may be included within this category. 3. Kicking events - any

number of categories which demonstrate foot co-ordination and skill, target shooting, penal-ties, dribbling, rugby drop kicks, hockey-style events. 4. Gymnastics — short, sharp

and usually somewhat tiring. In the running event teams may

be required to run a relay. Run-ning order will be at the discretion of the team captain.

In the case of a dispute the team captain and only the team captain will have the responsibility of re-

Presenting his team.

Tie breaking, in the team com-No. I will determine the testing

in the individual competition, the best effort in the last event will determine the individual place.

At all meetings the meeting referee's decision will be final and not

Eligibility for events

ONLY personnel who are fully costed to data processing activities are eligible for Computastars.

Only personnel who are employed by their present company prior to February 1, 1981 can represent that company.

Should a company they represent then they will no longer be eligible to represent that company after the date of leaving the company.

pany after the date of leaving the company.

Companies may enter one man's or one women's team or both, in each heat Additional churies of one men's women's teams may be made in other regional heats.

Teams inay consist of members of a company drawn from different locations.

Contract staff may be used subject to the qualifying condi-

Once a person has been nominated for a specific team, they may not represent any other team in the competition.

Once a team entry has been accepted there will be no refund of the entry fee

All costs incurred by teams are the responsibility of the teams.
All competitors, participate at their own risk and the organisers do not accept any responsibility for any injury or loss of personal of contrastive property.

company property.
All outries must be signed by the days processing manager or an aquivalent sutherity.

How to trap the electronic spy

signed to counter this trend.

occame a Federal standard on July

States and the security agency persuaded IBM to reduce the key

size from its original 128 bits to 56.

This gave rise to the charge that the NSA did not want a publicly-available code that it could not

break. Critics asserted that the

NSA could eavesdrop on commer-

cial transactions if it so chose by

reducing the DES key size.
Fuelling suspicious even

further, the security agency also asked IBM to classify its working notes on the algorithm. IBM had

inadvertently reinvented techni-ques similar to those used by the

agency in developing its own algo-

mittee on Intelligence held hear-ings, concluding that the NSA did

not tamper with the algorithm de-sign and that IBM had agreed that

about the DES. One opponent, Martin E. Hellman, of Stanford University, claims that DES en-

cryption could be broken quickly

by using many parallel chips to test all possible key combinations.

that a single chip searching one key per microsecond would take about a million days to exhaust all 256 keys, but that a million chips could search them in one day.

Public key

Professor Hellman is also con-

cerned about possible "trap-

doors" in the DES algorithm, which would allow IBM and NSA,

for instance, to break the standard

in minutes using a mini. IBM's Tuchman, dismisses the

possibility of secret trap-doors, saying that they would be detected

easily by NBS.

He also notes that if the 56-bit key were considered inadequate for an application, one obvious so-

lor an application, one orvious so-lution would be to encrypt twice for a total key length of 112 bits. Tuchman estimates that the power needed to exhaust a 113-bit key would employ all the energy in the United States for 600 years. if e looks more favourably on another suggestion by Hellmans

Fears of electronic spying and high-technology

fraud techniques have grown apace in the

United States side by side with the de-

networks, concern is growing in and unauthorised database access from remote terminals.

Computer-related fraud already accounts for losses estimated at \$2,000 million a year, a figure that is expected to rise dramatically as

As the stakes are rising, wiretap ping is becoming easier and cheaper. Also, since the wiretaps Before adopting the standard, NBS ran it by the National Securcan be operated remotely, today's cavesdroppers are less likely to get ity Agency (NSA), which is res-ponsible for code making and breaking operations in the United

Further, since information may be stolen without being removed, the theft can go unnoticed so the information leak can continue in-

What may be worse, the inruder who gains access to a database may not steal the information but simply change it. The firm then operates unknowingly with false data.

Key control

In the face of this increasing vulfor protection against unwanted

It takes the form of a data encryption standard which defines an algorithm, or set of procedures, for enciphering data before transmis-sion and deciphering the received

messages.
To guard against unauthorised access, data may also be stored in encrypted form. While the socalled Data Encryption Standard, DES applies only to US governa de facto private sector standard.

The DES algorithm is used for

encryption in combination with a secret 56-bit key to encipher data-in 64-bit blocks. The process involving transposition and substi-tution of individual bits under key control, the process being inverted to decipher the message at the receiving end.

Algorithm and key are analogous to an electronic combination mechanism and the key is the combination that locks and unlocks it.

Even if the mechanism design i known, a combination lock cannot be opened linless one has the combination. Similarly, even though the DRS algorithm is public knowledge, encrypted data is secure while the key remains secret.

Critical note

Users derive many benefits from the DES standard. It gives them a valuable yardstick to evaluate data encryption equipment and the standard permits mass-production economies for semiconductor firms which can thus implement the DES algorithm in reasonably-priced LSI, chip form.

Even so, there are a number of opponents who claim that the DES is inadequate and will only be useful for the next five years, since by then advances injurge-scale integration and computer science will make it possible to break a DES encryption easily. Others question the circumstances surrounding the adoption of the standard, which involved some behind-the-scenes manoetiving by IBM and the US National Security Agency.

DES history dates back to 1973 when the US National Burdan of Standards (NBS) requested the submission of data encryption algorithms for consideration as a Federal Information Processing Standard. pponents who claim that the DES

authenticating digital signatures.

Professor Hellman views public key systems as a complement to rather than a replacement of conventional key systems. While such systems may sound totally insecute, propohents claim that they are unbreakable since the decryption key is derived by a mathematical relationship hos complex for resolution by even the most powerful projected computer system. He compares a public key cryoto-system to a new kind of

Standard Information Processing Standard IBM responded by submitting an algorithm developed by Walter Tuchnian and Carl Meyen of its Communications Systems development laboratory in Kingston, New York NBS published the algorithm in Marchy 1975, and it crypto-system to a new kind of strongbox with two distinct combi-nations; the first used to lock the box and the second to unlock it.
Since the locking combination is
public knowledge anyone can lock
up information in it, but only the

velopment of the computer industry. MORRIS EDWARDS examines the US governmentbacked Data Encryption Standard (DES), de-

> s intended could unlock the box to retrieve the messages. Similarly, public key cryptoagainst forging messages by authenticating a digital signature. The enciphering key would be kept secret in this case and the

person for whom the information

While IBM's Tuchman acknowledges that the public key algorithm has merits, he warns that it must be researched, tested and validated before it can be considered

about six microseconds to encrypt or decrypt one 64-bit data block.

nomies of LSI circuitry may bring DES chips closer to the \$50 range.

In the meantime, the DES algorithm is meeting the cryptographer's acid test: it has been attacked for a number of years by experts in the field and they have not been able to show how to break Several magnifacturers have imolemented the DES alporithm in LSI chins and software implementations are also available. In hardware a DES unit takes

lt takes about six microseconds

to load a key or to load or unload either plain or enciphered text. typical software execution time

deciphering key made public enabling anyone to validate the signaa stand-alone encryption device may cost \$3,000 or more because of additional circuitry and the programming needed to support a number of terminals and operating So here it is — the solution to all our electronic espionage

COMPUTER WEEKLY, January 29, 1981

When budgets are tight LABHIRING EASES THE PRESSURE

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THE peripherals business is im-clude a 256-character buffer, a THE peripherals business is immensely convoluted and original sources of design and manufacture often defy analysis. For all the complexity, it is undeniable that the Americans are still the predominant manufacturing force in the data entry, text editing and word minant manufacturing force in the data entry, text editing and word UK market. A stroll around the processing Computer Peripherals Exhibition at the US Embassy will confirm SYSTEM

According to Roger McCauley, director of the US International Marketing Centre, "The UK mar-

ket for computer peripherals will reach \$3 billion by 1982 with US suppliers continuing to meet ap-proximately 60% of this demand." The figure of \$3 billion may smack of wishful thinking, but there are certainly rich pickings to

Products from 43 US manufacturers are going on display including electrostatic printers and plotters, floppy disc drives, VDUs and word processing systems. The two Sintroms - Ellinor and Electronnearly a quarter of the manufactur-

held at the Embassy for the first time, is open from 9,30 until 5,30 on February 3, 4 and 5 and it

listed all the manufacturers in alphabetical order plus their UK

ABLE COMPUTER TECH-NOLOGY Slatrom Electronics (R. Lloyd)

A range of PDP-11 enhance-A range of PDP-11 enhancements on display will include the Qniverter, a dual purpose bus converter which allows the LSI-11 Q bus to access Unibus compatible devices or the PDP-11 Unibus to access LSI-11 compatible devices. The Quadrasyuc/B and Quadrasync/C – four line DLII-G equivalents which provide an interface between the PDP-11 Unibus and four asynchronous communication display is the Finch 9401, another member of Control Data's range of storage devices and the Lark — 9455 eight-inch disc drive (8-mesons and the lark — 9455 eight-inch disc drive (8-mesons and the lark — 9455 eight-inch disc drive (8-mesons and the lark — 9455 eigh

ISG Data Sales (K. Osborne)

Hazeitine 1552 Datemedia DT80/1 Datemedia 3052

SYSTEMS Terminal Display Systems

This stand features VDUs ranging from a low-cost dumb teletype to intelligent buffered terminals. to intelligent buffered terminals.
The company's manufacturing political special speci installed throughout commerce and industry with a high percen-tage going to the OBM market.

BELLCOM

The Bellcom 80 is a word sor with a keyboard, similar to the IBM Selectrix with an equal ics - between them represent print quality and a large display screen. The screen is used for copy/input correction, while simul taneously printing out unrelated documentation. The device locates/replaces words hundreds of times in seconds. Copy can run through the display backwards or forwards at nine speeds and a display memory holds up to 25 pages with total floppy disp pages with total floppy disc

CONTROL DATA

Control Data (C. Keihley)
CP 81 provides the venue for the
UK launch of the Finch fixed eight-inch rigid disc drive. Also on display is the Finch 9401, another

DATA DEVICES INTERNA-

Eyecote (J. A. Robson)

PLESSEY

PHONE TODAY FOR A QUETE

CENTRE OF

DERIDHERAL

SYSTEMS

to reach \$3bn by 1982 drive mounting. CPU time is cut and the life of each reel of tape is extended. It incorporates a power driven, clutch tensioned packet arm system for tape stacking and DATARAM

Sintrom Ellinor (J. H. Ellinor) On display is the LSI-11 with compatible chassis, memories,

controller and micro. Features include a 51/4, eight slot chassis (24 amps on 5 volt supply); DEC LSI-11/2 microcomputer; DR-1155
dual board; semiconductor ADDIN; DR-115 quad board, core
ADD-IN; RF-11/RF-05 compati-

DATAROYAL

Facit-Addo (J. McDonald) Models 4525 and 4526 matrix printers are low-cost matrix prin-ters that print bi-directionally at

is a matrix printer operating at 150-200 chps. Its microprocessor Computer Ancillaries (I. control simplifies the unit into four modules with the keyboard built Maxidek magnetic tape transport handles both NRZ and PE tapes at 45 ips. It is supplied with dualstandard microprocessor formatter

PAUL FISHER PREVIEWS THE COMPUTER

UK market predicted

PERIPHERALS EXHIBITION

DIGITAL EQUIPMENT

Digital Equipment (D. Poole)
Numbered among products on display is the PDT 11/150 intelligent terminal. The two box enclocontains a microprocessor with up to 32K words of RAM memory and twin 1/4 megabyte floppy discs. The terminal can be a VT100 video or a LA120-GA 120 chps printing terminal. Also featuring the LA120-RA terminal, the LA34-AA terminal and the

On show is the Durango F-85. into the printer. The 1749 This is an all-in-one system comprising a processor, display screen, storage discs and printer. In addition, there is a word processing option consisting of a display screen, character printer and an embedded into the transport extended storage facility including a 12-megabyte Winchester disc

SYSTEMS

Floating Point Systems (C. M.

Peatured on this stand is a range of array processors for high speed scientific processing. These models can be attached to all major mini and mainframe computer of data in seismic exploration; calculation, reconstruction and en-



150 chps. A 9x9 dot matrix with ISG Data Sales (K. Osborne)

Featuring the new 4200 series imagnetic tape cleaner/evaluator cut printous. The 4525 uses an data terminals which satisfy data and allows off-line evaluation and 4526 uses 132 columns.

entry and output needs. They in selection of tape reels prior to tape

DATUM On this stand is the Century 22 true descenders guarantees clear-

Datum (Electronics) (K. Shuffle-

botham)
Presented on this stand are a formatted D451, 45ips, dual density magnetic tape drive; a CDC80 megabyte, storage module and a range of embedded computer peripherals including the TM/17 PDP 11 magnetic tape controller; PDP 11 storage module controller; PDP 11 disc cartridge controller; LSI 11 magnetic tape controller; LSI 11 magnetic tape controller; LSI 11 magnetic tape controller; MS Series I magnetic tape controller; Nova magnetic tape controller; Nova magnetic tape controller and the Nova disc car tridge controller.

CSPI
Buro Electronic Instruments (M. Dalley)
The Map series of array processors, when interfaced to virtually any must or supermini computer improves computational speeds by several orders of magnitude. Map offers multibus architecture allowing completely overlapped I/Os arthmetic processing and control non-interface direct addressing of bytes, 6-bit fall words, \$2-bit full words and 64-bit double precision words.

DIGITATA

DIGLDATA
Digi-Data (D: W. Holland)
Exhibited here for the first line
is the 2516 printing terminal which

DIGITECH DATA INDUST-

The Pacer which will be fea-tured at the exhibition is a diagnos-tic system with two sets of functions. As a passive data line monitor, it provides a window to the traffic at the RS232 interface. As an active device, it provides a interactive diagnostic by simulating a terminal, CPU or modem.

Also on display is the Encore 100 teleprocessing diagnostic system. teleprocessing diagnostic system and the Data Monitor 200, for mo-nitoring data communications.

DISTRIBUTED COMPUTER

DOCUMATION
Documation () A. Osbaldeston)
The DOC TPS-3000 is an offline impact printing system which
offers a compact alternative to use
ere wishing to telesse their mainframes for more important make.
Configuration consists of a
microprocessor driver control unit
and a 3000 impact line printer.
Also on display is the Impact 1400
series offering throughput speeds
of 1000, 1200 and 1450 ipm, using
a 48 character set at six lines per
inch. Power supply and control
logic site built into the printer.

hancement of images (X-ray, satellite and seismic) and the conversion of speech signals to compressed digital data.

stages of electronic equipment for an stages of electronic equipment de-velopment including original de-sign, production testing and field

HEWLETT-PACKARD

Statrom Electronics (R. Lloyd)

Featured on this stand is an indigarrial quality multibus development/control system. The
DCS-80, including dual eight inch
floppy discs, 5 slot multibus backplane and power supply, fits in a
standard 10.5 inch rack space. It
ptovides an alternative to OBM
system manufacturers.

DOCUMATION

Documation (J. A. Osbaldeston)

The DOC TPS-3000 is an offline impact printing system standard printer combines the convenience of local hard copy with
the speed of a video terminal. The
main points of the 2621 are high
pages (48 inches) of memory; a
maximum 120 chaps print speed
68-key, typewriter-style, detached
keyboard and character mode edit-

HOUSTON INSTRUMENT
Sintrom Electronics (R. Lloyd)
Digitisers and plotters on exhibition include Hi-Pad and Hi-Pion-Hi-Pad is an input device converting graphic information into digital values with user selection of various operating parameters by interface logic signals (jumpers). Among these is a choice of English of Metric scaling, data-format (binary/BCD/ASCA) and resolution of differ II,005 of 0.01. of alber 0,003 or 0,01,

ISG Data Systems (K. Osborne)
The 2300 range of Universal microcomputer development microcomputer development systems comprises stand-alone or multi-user systems capable of supporting the most popular 8 and 16 bit microprocessors. The company makes test equipment for all stages of electronic aguirrant de

Videoprint terminals cape either instant print, arguive a transparency. The Videoprin 3000 works with most percent computers with colour graphics pability. The Videoprint 5000 carbon adapted to work with most percent caster graphs. sophisticated raster graphic

INTERFACE MECHANISMS Sintrom Ellinor (J. H. Ellinor) The Model 8220 bar code par ter is an electronically-controlled serial impact printer producing random, batch or sequential mass of Code 39 labels or tags. A back two-line printer, the 8220 print ine and one line of free text. The printing mechanism consists of a ontinuously rotating print due and electromagnetically actually print hammers. Data input i through an RS232C seriel in

Kennedy International (R. C.

The 9800 half-inch tape time port incorporates a dual-denia operation at 556/800 cpl, tri-km automatic chipping levels, of function, LED indicators of dual-density embedded forms ters. The series 7000 disc drive is fixed-disc drive employing Winand three platters providing four, 12, or 20 megabytes of unfor matted capacity. The model 64% cartridge tape system is a backey for discs comprising the model 64% cartridge tape drive and the model 650 embedded formatter. MANNESMANN-TALLY

Mannesmann Taily (B. Lavelle)
A range of peripherals best displayed include: MT1602 em matrix printer which is bi-die tional 160 cpi and interfaced with Centronics or Data Products; its T1612RO, receive only, 7x 7 ar 9x9 serial matric printer; by T22000Q 200 lpm line printer and the T3300HR 300 lpm high reso

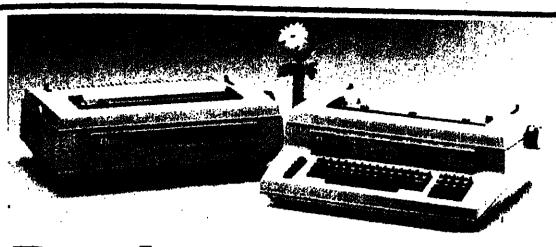
MICROPOLIS

Sintrom Ellinor (J. H. Ellinor) On show will be the Micro Da 200 series of eight inch rigid dir drives for mini and microcompute applications, requiring high-speed random access disc storage at a lower cost than the 14 inch drys-The series incorporates up to the platters and uses a Wincheso type head/media technology, last consists of a drive mechanic personal and a PCBA party which provides interface for a tachment to a controller. The in terface allows up to four drift units to be daisy chained to

MICRO-TERM
Facit-Addo (J. McDonald)
Three video terminals with 10 different emulation possibilities will be exhibited. The 4410 emulates Lear Siegler ADM 3A and Hazletine 1410 and it has edinal capabilities, block transmission video attributes and printer put. Video attributes and printer.
The 4420 and 4430 have appared keyboards and non-glare phospho displays which tilt and swive? A feature of the 4420 is emulation of DEC VT 52, Hazeltine 1500 and Lear Siegler ADM3. The 440 model is VT-100 compatible.

MILTOPE

MILTOPE
Sintrom Ellinor (J. H. Ellinor).
The DD400 flexible disc dive to be displayed is a RAM device that provides over three million bits of ordine storage of interchangeable floopy disc mental accessed in random sequence and data is random sequence and data is random sequence at a pair



STEP ENGINEERING ISG Data Systems (K. Osborne)

The Step 111 bit-slice de-

velopment instrument is a

hardware development tool for all bit-slice applications. It incorpo-

rates the world's fastest PROM

The 4500 storage subsystem in creases the productivity of in

on display is the STC 8650 double density disc drive which offers double the amount of data per

spindle, or a total of 1270 mega-bytes. There are two models of the STC 8650: Model A2 contains

must be attached to an STC 8000-

11 disc control unit; Model B2 at-taches to the 8650-A2.

Bit Pad and ID provide XY co-

ordinate information to the computer system. The Bit Pad is for

menu picking in many diverse ap-

plication areas such as data entry,

requires larger tablets or more exacting data manipulation within

The Comm Stor range of com-

munications storage units com-prises four models for attaching to VDUs or printers to provide data

storage. They provide elaborate data preparation, logging, editing and forms capability. Time

sharing users are promised savings in phone costs and connect time

On display is the TDX Series 11

TELEPROCESSING PRO-

Electronics (P. A.

the digitising system.

SYKES DATATRONICS

<u>SUMMAGRAPHICS</u>

Sprint 5, the microbased daisywheel printer from Qume Corp is designed for easy integration processing

applications. The printer comes in keyboard and receive-only versions,



US Embassy February 3-6

Products from over 40 US manufacturers on display

rate of 250 KC (500 KC double density). Track-to-track access is accomplished within six milliseconds. The device is designed to MIL-E-16400 and MIL-M-NASHUA

simulator, a built-in logic static analyser plus terminal and debug-panel controls. Nashua Computer Products (F. STORAGE TECHNOLOGY STO Storage Technology (C. T

A range of disc packs and floppy discs includes the Nashua 4473 disc pack - 300 megabyte - for use with CDC, Prime, Wang, and other equivalent disc storage drives. The 4464 80 megabyte disc pack is for use with ICL, GEC and similar disc storage drives. The 4443 disc cartridge – five and 10 megabyte – can be used with DEC, RLOI, and RLO2 disc storage drives and Nashua 4420 disc

PIONEER MAGNETICS, Sintrom-Ellinor (J. M. Ellinor) Dependables are single and multiple output, high-current power supplies for OEM digital applications. Output transients sed by active loads do not exceed the regulation band in either overshoot or undershoot. The main features include the widest range of brownout protection; 30 millisecond output holdup after input power loss with full load protects volatile memories; short-circuit proof and overvoltage protection.

put power loss with full load and draughting, business, medical, petrochemical and games. The ID range caters for the user who

Plessey Peripheral Systems (S. King)
The stand's centrepiece is a microcomputer system based on the LSI-11/2 processor. There are also a number of add-on peripheral products from the range of equip-ment for DBC and Data General

Buro Blectronic Instruments (M. sharing us in phone The 6000 is an impact printer charges.

sultable for mini or microcombusiness coinputer systems or as a message receiving printer. The 1000 magnetic tape communicating system is a triple port storage device with R\$232C compatibility. Also on display is the \$100 jape cartridge storage system for military applications. which is a 75 lps tape transport, suitable for OEM and end user applications. The unit incorporates a low inertia tape buffering tary applications.

QUME
Facit (J. McDonald)
ISO Data Sales (K. Ceborne)
Featured is the Sprint 5 KSR
printer that produces letter-quality
copy at 55 chps. Many options can
be elected to configure for a particular data terminal or printer. Johnson)

A modem simulator, the TP-232, is used to replace a pair of modems in short distance local applications. The TP-270 Network Analyser measures system response time in a 3270 network. More significantly, it provides specific measurements of the efe-RAMTER CORP Terminal Display Systems (R. ments contributing to response time, so that changes can be evaluated

DUCTS

Crumpton)

The 6000 Series colour computer is provided with English language commands such as circle, line, fill, etc. A range of resolutions is available to suit various applications from 512×256 to 1,280×1,024 A maximum of 16 colours can be displayed from a palette of 64. Typical applications are management information aspaces, command control and education.

Spaces, command control and educations who is the latter incorporating magnetic libble means requiling high speed printers the 120 cation.

ter, with the 150chps Omni 800 impact printers, the 810RO and 820KSR, are also on display.

Euro Electronic Instruments (M. Dalley)

Power peripherals being displayed include Line 2 power conditioners, an ultra-isolator and AC line regulator. The Line 2

regulating properties of the AC line regulator.

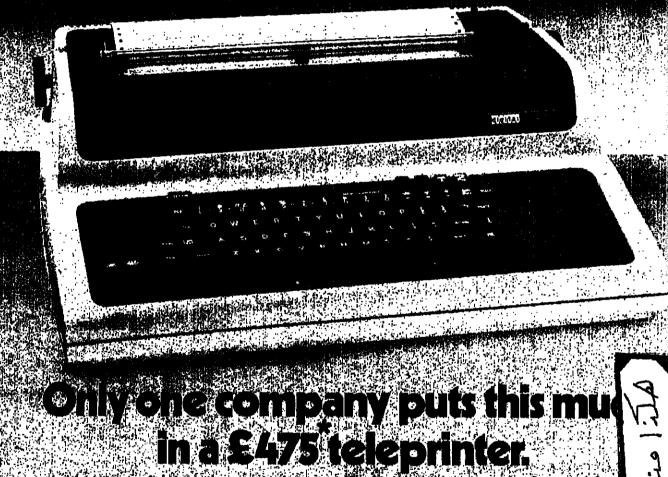
Versatec Electronics (W. R. Bof-

raster format while freeing the computer for other tasks. It accepts all print, vector, compressed raster, or raster plot data from magnetic tape. In addition there is the V-80 series of electrostatic

printer/plotters. The main features nclude: high-speed printing, 1000 words per minute; high resolution,

WABASH TAPE Wabash Tape (UK) (J. A.

gnetic tape produced and fled in a virgin state with its tered surface guarantee minimises error growth por for read failure, climinates no



SOcps teleprinter. It's compatible with just about every computer there is, it's depend-able, its readily available, And it costs just

£475 on orders of 200. Only the LA34 iteleprintered give vol. so much Only one with manufacturer could charge so little for it. roiditai" tonisee, we te the mouds leadini manufacturers of terminals. And when you look at the LA34, you see why.

Principal Features: l. Desk-top unit based on conventional typewriter design → ensures rapid operator acceptance

True 30 ope average speed, 45 cps catch-

3: 9x7 dot matrix gives remarkable clarity.

4. Füll 128 ASCII character set. 5 10:12 13:20/16 5 characters per inch. 6 Up to 132 columns using standard font,

218 columns using compressed font. Adjustable line specing: 2: 3, 4: 6: 8, or 12 lines per inch

8: Uses ordinary paper: single sheets, i or continuous listing. Easy-to-change cartridge ribbon. 10. Just 25lb weight

Numeric keypad, Tractor feed, Termil arano, caper roll notder raper tray. Paper switch. "Paper low" switch. 20mA interface. Extended logic option. Optional spacing:



NHS No

(member) operation

lmomberi

5. Function name: Handle Patient's D 6. Response regid: Online (immediate

Action Vol Not

Frequency assumption
40 max per month, 40 aver per

FUNCTION ANALYSIS DOCUMENTATION ACCESS PATH FOR A FUNCTION

Entity type (E) relationship type (R) – Accessed

Patient undergoes

Patient makes

Patient has Pationt's Medication

ationt's Medication

How to become a competent programmer

Guide to Good Programming there is a contribution entitled De- Performance which is mainly Forand Patricia Heath. 128pp. £10.50 (hardback) and £3.95 (paperback). Published by Ellis Horwood Ltd, Market Cross House, Cooper Street, Chich-ester, PO19 IEB.

THIS collection of 19 essays is grouped in five chapters with contributions from 10 different authors, providing a readable ac-count of an excellent range of top-

Chapter I is entitled Strategy and Design and the introductory section states: "The object of this book is to present, in a compact and assimilable form, the essenserious and competent pro-

Readable

The chapter goes a long way towards achieving this objective and the topic of good programming practice is best approached in this format.

In a textbook any omissions, and these would be inevitable, might lead to criticism by a reader

Europe's leading showcase for

minicomputers; peripherals;

the majority constating of directors, managers, date

processing managers, systems

Please provisionally reserve

stand space at Compec Europe

managers, systems analysts,

sign of Algorithms, which is one of tran-orientated.

the longest essays in the book.
It is both readable and, among other things, gives a very good account of recursion with reasons

gether with some simple examples. This is a technique which is often difficult to explain to students who have not found the need for it and this account is very well pre-

Chapter 2 is on program writing and covers choosing the language, programming language standards and structured programming.

The programming language standards mainly refer to Fortran, tials of what is involved in being a but there are points which can be applied to many languages.

The essay on structured programming is practical and one of its best features is analysis of a subroutine presented first in its original, unstructured, form and then re-written with the improve-

ments explained in detail.

The third chapter, Program Development, has three contributions: Structured Programming and Error Prevention which ought might lead to criticism by a reader missing his or her particular fetish.

Taking a few essays at random may give some impression of the topics covered. In the first group

Chapter 4 bears the heading Special Problems and covers heuand justification for its use to- programs with long run times and real-time programs.

One example worthy of note is contained in the essay Large Quantities of Data which uses as an example the computation of mean and standard deviation from a set of data. This is one of the most programmed algorithms.

This text is to be recommended most strongly to any student or experienced may not agree with every statement or view expressed in the book but would acknowledge the thought provocation.

As a final quote from the Introduction explains: "Some of the advice may strike you as trite and obvious; if so, well and good. If some helps you to recognise, for-mulate and rationalise things you already know into a coherent 'philosophy of programming, even

"If anything strikes you as a new idea worth considering (or possibly as a brilliant flash of enlighten-mentl), that is best of all."

Comped Europe 181 is sponsored by

Already the demand Poststanding Duton
Already the demand Poststanding Duton

outstanding Ensure your participation

in this prestigious event which serves

the festers growing sectors of the

UBLITHE FORM BILLOWING

more depails

commuter market

terminals and microprocessors puellostions with TERMATIONAL SALE COMPUTING TO THE TERMATIONAL SALE CONTURNS TO THE TRACTICAL COMPUTING TO THE TRACTICAL COMP

AT THE CENTRE OF EUROPE'S BIGGEST & CONCENTRATED COMPUTER MARKET

IFIP report is weighty in every sense

Information Processing 80,
Proceedings of IFIP Congress
80. Edited by Simon Lavington.
1070pp. \$102.90 North-Holland
Publishing Co, PO Box 211,
Amsterdam, Netherlands. Tel:
010/31/20/5153347.

Database technology, with the social and economic implications AS consolation for those unable to attend the IFIP 80 congress held in Tokyo and Melbourne of computers, were the two top-ics treated as areas of interest in last October, the proceedings are now available in the form of a hardback book which is weighty their own right for the first time

Invited papers in the social and economic area included a depressing but thought-provoking Edited by Simon Lavington of Manchester University Department of Computer Science, the book details all 160 or so invited discussion initiated by Calvin Gotlieb of Toronto University Department of Computer

Gotlieb predicted that the use f computers would inevitably become more controversial with tainty in the manufacturing sec-

The only major parts of IFIP 80 not covered are the 30 plus panel sessions held in Tokyo and He produced figures showing how several different organisations had increased productivity dramatically despite big reduc-tions in their workforces and saw a day when computer professionals would refuse to participate in job-shedding projects.

The eight other subject areas

covered by IFIP 80 were theoretical foundations of information processing, computer architec-ture and hardware, software, at two locations.

Tokyo provided the opportunity for English-speaking representatives from some of Japan's leading computer manufacturers

Ture and nardware, software, computer networks and communications, computing in science and industry, business and government applications, computers in everyday life and information processing and education. K.J.

Making case for **'project**' approach

Project Management: A System Approach to Plannias, Sub-duling and Controlling, he Harold Kerzner, 500pp, he lished by van Nostrand Re-hold (1979).

THIS book sets out to sell the ite of project management - 4 me agement organisation structure around the production of 1 me cular product. Kerzner argueste a project structure leads to grammanagement control, better of management control better francing and budget management to an eventual better franciperformance for the company.

Using plentiful examples re-

Using plentiful examples at case studies, Kerzner shows how project organisation can be inn duced in a company and her is should be organised. Later chapters explaints

lanning process, show by ques can be used in scheduling review, describe pricing, and a plain schedule and cost control. Kerzner writes confidents short sentences rich with Am can management jargon, but

style conceals a genuine union standing of his subject and its The book shares the intimost management texts - milit the process seem very straight ward and simple - but the ma cal chapters in particula a authoritative and useful.

Fun approach to maths

Adventures with your pocket cal-culator, by Lennart Rade and Burt Kaufman. 139 pp. 95p. Penguin Books Ltd, 536

in every sense of the word.

and submitted papers, discussing

the information or message pre-sented often considerably more

comprehensibly than the actual spoken presentation.

Melbourne. Summaries of these were scheduled to appear after the congress in the Australian

Computer Journal and the Journal of Information Processing published by the Information Processing Society of Information

rocessing Society of Japan, IFIP 80 was the first World

Computer Congress organised by the International Federation for

Information Processing to be held outside North America and

Europe and the first to be staged

ONE gripe I have always had against pocket calculators is that they weaken drastically the user's powers of mental arithmetic, Here s the antidote from Penguin Books.

Both mathematicians, the authors assume that the reader knows his/her way round the keyboard. If you don't, first read up

on how to use a calculator.

The book is divided into two parts: a section in which the adventures are outlined and a section in which comments are made about them.

Most makes of calculator will be adequate for the exercises, though one or two of the tests require a unless you want to work ou w

There are 20 chapters com magic squares, playing minumbers, least common multiple; squares, palindromes, the potent number, prime numbers, etc. As a fun approach to mathe

using pocket calculators, k we doubtedly succeeds: it must cal make your brain hurt. CHRIS YOUE!

Feast of DP meanings

nary and Speller, by Charles J. Sippl with JoAnne Coffman Mayer 19,70. Prentice Hall in-

DP PROPLE and those who white about them are constantly extending their vocabularies with the latest buzz-words, acronyms,

"electrospeak" (these words; incl-dentally, are not part of the diotic-nary; but culled from the fly-leaf) this volume provides a ready source of both spellings and meanings. it defines more than 15,000

computer terms, and is illustrated with more than 100 pictures. Much of the information will be

familiar; some of it less so. For instance, hands up all who know what is a variolosser* or a Pros-And if you thought that "smudge" was an acronym for the

latest in new technology; test asnothing more than 'in optical character recognition ink that is some place it doesn't belong". Did we really need to be told that?

Rromauch explanations, readers will have gleaned that the authors

"fiberoptics", "signaling")
Sippl is a computer industry
consultant, and was the aither of
"Computers" for the Roccione
dia Britannica, while Johns
Coffman Mayer is Director of his
Processing at Palomar College,
Marcos, California.
Whatever unfamiliar works as
The Contemporary of the c

spellings they have come up this volume could well proje the an essential reference book for else would the review copy as found its way to Compute West sub-editors' desk?

*Of creative you all knew this a varied set is "a variable attended in a deal whose loss is controlled by volume of cutrent"; and Prospert is "a deal cutrent".

are American. Hence some slightly unfamiliar spellings ("defense", Mine of standards information

Programming Language Stan dardisation, ed. I. D. Hill and standards are releveloped and the standards are releveloped and the standards are developed and the dilumate purpose of standards are usually encountered in the context of a particular language of software system. While such discusses particular software standards are obviously valuable, dards, an introductory dispute on philosophical discussion and fer standards are obviously valuable.

The book is a "mute of area in the standards information of standards information of standards information of standards are discussion of standards are discussion. Part II consists of standards in go issues, constructed to interest of the standards are discussion. The book is a "mute of area in the standards information of standards in formation of standards are discussion."

The book is a "mute of area in the standards in formation of standards in formation of standards are discussion."

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The book is a "mute of area in the back in th

DATA ANALYSIS

PART 14 of the series described the technique of access path analysis, a method of determining

and documenting the types of enti-ties and relationships involved in a

In order to perform access path analysis we had first to identify the

"elementary functions" and then to draw functional models describ-

Documentation

entry points be determined for each function, but quantifiable facts must be available on the fre-

quency of the activity on the data.

knowing that the patient entity

type is accessed, unless it is also known how often it is accessed,

500 times per day, 200 times per month, etc. When designing a database only a certain number of

access paths can be made efficient,

hence the most important func-tions must be established and fre-

quency estimates made. All the

this information - it only requires

tion" documentation form is

shown in Figure 1, filled in with

the example used in previous arti-cles, the "Handle Patient's Death"

In Part 10 the function "Handle Patient's Death" was described and the form used to document

functions was shown. It can be

seen that the frequency of the func-tion was documented. It is this

figure that is used to make the

Frequency Assumption (7) on the

The Response Required (6) is that required by the user, e.g. he may be prepared to let it wait for a

day, it may be urgent (because it affects other functions), or it may be so infrequent and unimportant that the response required may be "within a week":

Access path for

function form

The description from the func-tion form, the data flow diagrams and the function hierarchy are all

used to perform access path analysis. The steps used to draw

the function models were ex-plained in Part 14. The access path

for a function form is filled out at

the time the function models are drawn. It is schieved as follows:

The description of the function is worked through and each entity

type and relationship type listed in the order in which they are likely

2. The action on each entity type is

are used to denote the permissible

M - Modify (one or more attrib-utes of the Entity)

to be involved...

Retrieve

C — Create D — Delete

actions;

sic facts are available to provide

The "Access Path for a Func-

in this article.

More complex functional models

Section I — Part 15

of our series describing a system design methodology

by Rosemary Rock-Evans

ing them. Access path analysis has several purposes, two of which modified (M) and Operation and appointment have been deleted.

The action on each relationship the checking of the entity model and the provision of the facts for database design — will be explored type is recorded. The following symbols are used to denote the - Connect (add a member

D – Disconnect (delete a member) To help the database designer, not only must the access paths and

· Transfer (disconnect a member from one relationship and simultaneously connect it to another of the same

RELATIONSHIP TYPE

Patient contracts lifness
Type of Illness
Type of Illness
Type of Illness has Illness
Illness

Figure 2, "Intersection,"

relationship type only)

entity type.

R - Retrieve (implies use of

4. The selection criteria used

access an entity type are recorded. Selection may be made via:

a) The attribute types which constitute the key of the entity type, e.g. in the example, the NHS number is the key of the Patient

types, e.g. if a range of keys was

Where entities of one type are

relationship type with an entity of another type, it is said flust the single entity is the comer and the many entities found, by the relationship are the manbers.

ties of different types. An example is shown in Figure 2 where an "illness" entity has been found by the intersection between the relationships with two entities Patient and Type of Illness. 5. The Volume figure always des-

SELECTION

tity types accessed, two methods are available:

) The figure can be completed by

minimum degree of the

relationship were documented as shown in Figure 3 (the example is

of the relationship type "Patient Undergoes Operation").

actually undergoes an Operation, the average degree is 1:4. Assum-ing that 50% of those operations

are in the past and 50% in the future, the task of "Cancelling Operations" would on aparage involve two Operations for every Patient. The Volume field in the Access Path Form has thus been

set at two.

The same process can be performed for an Appointment. As aims the average degree is 1.6 and

c) Attribute types other than the Using this information, we key, e.g. All Males (sex code) over know that for every Patient who occupies an Operation,

related to an average of 4 ehlities of type Operation

cribes the number of entities of the entity type which are accessed per unction, NOT per month, or per day, etc. The per month or per day volumes are calculated later.

Thus, in our example the func-tion "Handle Patient's Death" handles one patient at a time. To calculate the volume of other en-

completed, the task of Cancelling the Appointments would on average involve 3 Appointments. luximum figures can be used as

The Access Path Forms will be discussed in detail in later parts of the series, when database design considerations are covered. It can be seen, however, that knowing the response required, and details of the frequency of functions, pro-vides the database designer with

Temporary entities

Access path analysis occasionally leads to the discovery of entity types which have not been identified in the earlier stages. It is possible for entity types to be created and destroyed during the execution of an elementary funcemployee received as pay in the week, may only exist for the event tion, making the entity type so temporary that it may not have been identified until the function "Pay Employee" and then be archhas been examined in depth Temporary entities can be as im

portant as the more permanent en-tities which are used by more than one elementary function, and must

It is often found that these temporary entities have attribute types, which under the old systems porary should be left until all the functions have been analysed. The

Owner

design methods might have been found in the working storage sec-"temporary" entity types andidate transaction files, but i be found that they have add importance which requires the be part of the DBMS and of a entity sub-types. They have their permanent nature. own unique attribute types and Decisions such as these definition: for example, in a never be made at the ar stage. Compromises should payroll system the Salary/Wage Payment entity type, i.e. what the ever be made during design,

> during analysis, when they a This article has covered path analysis documentation the functional model. In the part of the series the Access Analysis Forms will be us

The Data Analysis methowas developed at CACI by Palmer.

TDS offer the ADDS Regent 20 for as little as...

Decisions

to be left

Decisions on which attribute types and entity types are to be

b) The information provided on the relationship type forms can be used. The Relationship Type Form was discussed in Part 5. In this form the maximum, average and Using this information, we

easy to read 5 x 8 characters in a 24 x 80 character format. EIA Interface: speeds up to 9600 baud. Ful

incremental cursor movement and addressability - anxillary output interface, print transparent capability plus monitor mode all this for only £399. If you can find a higher value terminal at a lower cost then buy

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sometimes (80%) an average of entitles of type Potient related to Operation is of type Figure 3.

D - Delete

The term intersection is also used, when an entity or entities of used, when an entity or entities of one type are retrieved by using the the entity type Patient have been relationships with two other enti-

A TERMINAL, the ZIP
ASR/K7, incorporating two mini
cassette drives, printer and keyboard in a single unit is available
tion header of up to 20 characters.
Data is stored in blocks of 249
characters and each cassette has a
31,872 character (128 block) capafrom Data Dynamics.

This unit is the latest addition to Data Dynamics' range of ZIP computer terminals and can be used on a desk top or optional purpose-built stand.

Cassettes can be operated in either a local or online mode, fully emulating the paper tape reader-punch facilities available on a paper tape ASR.

This allows the ASR/K7 version to replace the paper tape ASR in a working system, without any changes to the host equipment hardware, software or the connec-

As with the paper tape ASR, the cassette version responds to DC1, DC2, DC3 and DC4 control codes and operates transparently to the

31,872 character (128 block) capa-

Although up to 10 different files can be opened on each cassette, any file can be as long as required.
Communication online with the
ZIPASR/K7 is at 300 or 110 baud.
The standard interface is V24

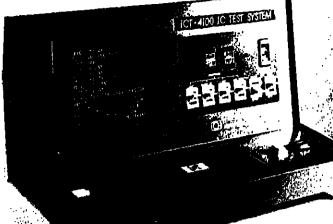
(RS232C) or 20mA current loop operating at half or full duplex (user selectable). Even, odd or no parity may be chosen. A seven-needle print head is em-

ployed which prints the full ASCII character set in 5 x 7 dot matrix The ZIP ASR/K7 with a friction

drive can employ standard

nd operates transparently to the ost system.

Data Dynamics (CW), Data-House, Springfield Road, Hayes, Middx. Tel: (01) 848 9781.



THIS easy-to-program IC test system, developed by Minato, is available from MIT (Engineering) at a cost of around £17,000. The system enables all TTL devices to be tested and carries out DC parametric and functional testing of parts up to 24 pins.

Called the Minato ICT 4100, it has a VDU, six switches and a thumbwheel. Programs are stored on floppy discs,/paper tapes or cassettes and fault analysis can be carried out.

Test results are given by GO/NOGO as well as displaying three digits on the DC test.

Floppy disc, and paper tape readers/punches are available as options and MIT is currently developing programs for all testable devices, the results to be sold with the system on offer. MIT (Engineering) (CW), Greenhill Industrial Estate, Riddings, Derby DE55 4DA. Tel: Leabrooks (077-384) 604411.

Open reel tape drive with advanced features

TEKDATA Electronics has re- The drive can be returned to a leased an advanced open reel tape drive. Full advantage has been taken of LSI low power Schottky TTL with a recording density of 800 or 1600 bpi (NRZIPB).

The system can be existed by the drive can be returned to a steady state on command from the formatter after power failure and there is no heed to reload the tape manually.

Maintenance has been simpli-

The system can be switched by fied because of the modular conis determined by the tape automat-

Maintenance has been simplithe system can be switched by the tape drive, formatter or under program control and operator error is eliminated when reading back tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes are tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is determined by the tapes as the recording density is determined by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is determined by the tapes as the recording density is deferred by the tapes as the recording density is determined by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes as the recording density is deferred by the tapes are tapes as the recording density is deferred by the tapes as the voltage can be accommodated with an average estimated power con-sumption of 140W (250 Watt

There are 8-inch (MT-800) and 10-inch (MT-1000) reels. All models accommodate ISO, ANSI, ACMA, JIS and IBM-compatible data formats enabling tapes produced on the MT-800/MT-1000 to be processed on computer systems

Brochure

A BROCHURE describing the Petbow Powercentre electronic control system is available on request from the company.

Petbow (CW), Sandwich, Kent. Tel: 03046 3311.

The formatter has been simplified compared to conventional designs. It is small enough to fit inside the tape drive unit with up to four drives daisy chained.

There are also been simplified compared to conventional designs. It is small enough to fit inside the tape drive unit with up to four drives daisy chained.

Receives

Brochure

Paper Tiger to bridge print gap

duced a printer which is said to bridge the gap between conventional matrix and daisy wheel

The Paper Tiger 560 offers full width 132-column printing at 160 chps, and many "print versatility"

Unlike most daisy wheel printers, it has an inbuilt tractor feed

To achieve this level of printout, Teleprinter Equipment has developed a unique nine wire staggered column ballistic head overlapping the dots of each mat-rix character vertically and horizontally with one pass of the print head filling in the gaps between the dots.

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tional counterparts cannot match. To cut consumable costs, the ink ribbon drive mechanism is designed to use all parts of the rib-bon. The cartridge contains 36 yards of ribbon and is rated to print up to 16 million characters.

Another major feature of the unit is that it incorporates a bidirectional logic-seeking device allowing reverse printing and

The 560 also has selectable features like mono or proportional spacing, automatic justification, programmable horizontal and vertical tabbing and "fine" positioning for word processing appli-

character set, eight software selectable character sizes, panily and RS 232 serial interfaces and XON/XOFF line protocol.

Teleprinter Equipment Ltd (CW), Akeman Street, Tdg. Herts HP23 6AI.

Printer takes a bow

ROXBURGH Printers has added the X80SP Intelligent Printer Plotter, to its existing printer family, claiming that it includes more features than adv needs printer in the same printer in the same printer.

printer in the same price range.

These features include the character generators each will 128 characters (one being full programmable), bi-direction nting and paper feed, 8 x 8 crix, horizontal and vertical

with interfaces for: Pet, Apple II HP, Centronics parallel and RS232C.

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Roxburgh Printers Ltd (CW) 22 Winchelsea Road, Rye, L Sussex TN31 7BR. Tel: (6793)

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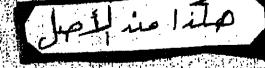
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> Recruitment Manager, Systime Limited, Concourse Computer Centre. 432 Dewsbury Road Leeds LS1

Track record matten in to QUIS?

Making Computers make sense

International Personnel Consultants
Modus Management Services Limited
148 Watling Street, Radlett, Herts. WD7 7JH

Telephone: Radlett (09276) 3077

New Technology is just History in this Company

Our client is one of the largest independent software and systems services companies in the world - a company which has a long history of involvement in some of the most innovative and important systems ever developed. Indeed, some of the British company's achievements are well known both inside and outside of the computer industry, providing benchmarks for successive development projects undertaken by other organisations.

Guaranteed Growth

The increase in business now concluded for 1981 and beyond, is in stark contrast to the lack of growth currently being experienced by some areas of the computer services industry. The immediate result is that the number of professional staff will be substantially increased, since the new business will provide on-going project work for successful candidates

Career Prospects

In view of the growth factor and the way in which our clients assign staff to project work, there is no doubt that there will be progressively more room for extremely senior consultancy and project management positions as time passes. Additionally, our clients approach to project control and system design is entirely modern and exposure to these methodologies is certain to enhance and increase individual professional capabilities.

£10,500-£13,500 range, although a few more senior positions are available. Naturally, additional benefits such as a pension scheme, free BUPA, interest free season ticket loans etc also apply.

The Company H.Q. is in the West End of London, so although most appointees may be working on site in the N.W. Home Counties for most of the time all candidates must be prepared to work in London. Full relocation expenses will be available if necessary.

Systems Analysts

These positions equate more readily to "Senior Analysts" positions in general and would therefore be suitable either for individuals already at Senior Analyst level looking for a move to consultancy work or for individuals who feel they are ready for promotion.

- Essential expertise must be thorough experience of establishing and defining user requirements.
- First-class communicative skills, both oral and written, will naturally be expected from all candidates.
- Knowledge of modern analytical methods, such as data analysis, would be a major asset although not a pre-requisite.
- Machine and software backgrounds are not relevant at this stage but experience of on-line-systems is absolutely essential preferably for large multi-user and multi-site systems.

Systems Designers

A broad range of skill requirements exists within various design teams, providing opportunities both for designers with a leaning towards software and for Analyst/Programmers who have not moved into pure

The technical areas of particular interest are:-

- Communications Systems Design including message switching, voice network, traffic pattern and work load pattern establishment
- Software Design and Programming development work on both operating systems and communications interfaces.
- On-line Systems Design experience of man/machine interfacing and terminal based systems is essential.
- Database and DBMS Design knowledge of how a vast amount of informátion can be structured, processed and distributed.

Contact: Andy Wright or Mike Creamer

Cornwall Education Committee CORNWALL TECHNICAL COLLEGE, REDRUTH PRINCIPAL: Dr. K. Farnell CORNWALL MICRO-ELECTRONICS CENTRE

Senior Lecturer in **Micro-Electronics**

This is a senior post covering all aspects of mioro-electronics on a broad front, ranging from the engi-neering aspects of system design to software de-yelopment in the fields of Data Processing and Control Engineering:

The successful applicant will be expected to be well qualified, particularly in ejectronic engineering and have had alignificant 'hands-on' experience of modern milero-processor based systems.

SALARY: SENIOR LECTURER:

£8,952-£10,839 (ber) £11,295

Further details and application forms may be obtained from the Principal to whom completed forms should be returned within three weeks of the appearance of this advertisement, 8,s.e. please.

■Cornwall

ANALYST/PROG. Attractive opportunity for self-starter with sound commercial systems exp. and fluent COROL or BASIC. For small expanding OEM, Central eystems exp. and music Court in the London, Per. Bi/18 London, Paggrammers, Financial information service + 2 years exp. BAL or PL/1, City, Paggrammers, Paggramm

PROGRAMMERS: Financial information service + 2 years exp. SAL or PL/1. City.

B45 9/26

SYSTEMS ANALYSTS: For Banking Systems development, 2-4 years exp.
BASIC essential. DEC and Banking exp. desirable, £7,000-£8,500. Central Long
don.

PROJECT LEADER, For customer technical support, 4-5 years BASIC essential.

DEC and Banking exp. desirable. £8,000-£9,500. Central London

Ref, 81/22

ASST, D.P.M. Exp. Analyst/Prog. with Banking exp. £10,000-£10,800. City.

Hat. 81/23

OPS SUPVR Exp. Senior Op. with supervisory exp. \$/34 or DEC. City. Ref. 81/24 SYSTEMS PROG. IBM Airline Control Program, exp. 3-6 months, London.



70 Borough High Street, London SE1 1XF

5th FEBRUARY COMPUTER ENGINEERS TEST & REPAIR Interviews at Cunard International Hotel Shortlands, Hammersmith, W6 or telephone Paul Rasmussen NOW 01-572 0933 PRIME

THURSDAY

SCIENTIFIC

Analyst/Programmers and Programmers. Fortran/Coral/Assembler on minis required by London-based Systems House for European and UK assignments on scien-tific and military contracts. Mobility essential

or on-line environment sought for new networking/comms pro-jects in Bucks and Central London. Of particular interest: message switching, access controls, user de-finitions, etc.

£7.5-10K

NETWORKS

Analysis (3-5 years' in TF

£8-13K

Programmers & Analyst/ Programmers & Analyst/ Programmers with 3 + years' PL/I, ideally with some TP and DB know-ledge required by Admin-istrative headquarters of leading oil company in the Netherlands.

HOLLAND

IBM & HP

Analyst/Programmers, 2+ years' in com-mercial environment and COBOL pro-gramming on IBM 370/4300 or HP equip-ment, required for Commercial Systems Group of Major Oil Company, at their West End offices. TP and Database experience also of considerable interest. Excellent company benefits.

£8-11.5K

SYS. DESIGNERS COMMERCIAL

Senior Systems Designers with 5 or more years' experience in the design and implementation of large on-line commercial systems (IBM) plus specialist knowledge of IMS needed by British Software House: London base but initial term overseas (c. one year). Excellent overseas allowances.

£9-11K

SPECIALIST

Data Analysts - IMS Programmers and Ana-iysts with 3+ years' mini or micro Assembler (DEC in particular) experience plus relevant (i.e. scien-tific) degree required for producer of Industrial Control and Automotics specialists who have ex-perience in systems design and implementation required to fill technical specialist role and applica-tions consultant positions at advanced User Installa-Control and Automation Systems. Offices in Herts. e £13K £7-10K

PROCESS SOFTWARE CONTROL ENGINEER

> Hardware and Software specialist with good micro knowledge required by Micro Manufacturer to provide software implementation and support service from London base. Wide-ranging applic £10K

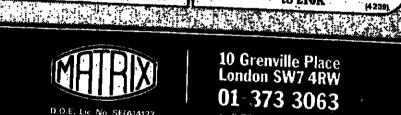
HOLLAND GERMANY

Analysts, Designers and Programmers with real-time control experience on minis or micros (Assembler level), wanted to join European branches of Systems House specialising in the automation field. Generous relocation, some positions

£13-18K

MIDDX

Programmers, Analysts and Team Leaders with COBOL experience and, ideally, some knowledge of structured programming techniques required to meet expansion plans for development centre of leading manufacturer. Degree preferred. Commercial/financial applications experience necessary.



10 Grenville Place London SW7 4RW 01-373 3063 to 8.30pm 7 days a week

Computer Service Engineer SAUDI ARABIA

Saudi American Bank, an alilliale of Cilibank NA* la durrently under 10 mg e large scale explansion of its on-line feat lime data processing lacilities A computer service engineer is required to assist

accommodation One month's paid leave sach year will paid sireach veal will paid air late ional lamily members io uls of sould air one week's paid late ional lamily members are late in a late ional late ional lamily members paid late ional lamily members paid late in sould late in a late ional late in a late ional late in a late ional late io

الساق السعوي الأمريكي Saudi American Bank (3)

SHAPE TECHNICAL CENTRE THE HAGUE (HOLLAND)

SHAPE Technical Centre - a NATO Research Organisation - has a vacancy for a

SENIOR SYSTEM PROGRAMMER

INITIAL SALARY DG.37,125 NET PER ANNUM

for its Control Data Cyber 740 computer system. The successful candidate should have broad experience in data processing with at least three years in systems programming for a CDC Cyber/6000 computer system.

Good knowledge of programming in high-level languages and macro-assembler at the operating system level is required.

Starting salaries will depend on qualifications and experience and may be increased dependent on the family situation.

Applicants (NATO nationals only) should send a brief personal résumé to Personnel Officer, SHAPE Technical Centre, P.O. Box 174, 2501 CD The Hague, The Netherlands.

IBM MVS SYSTEMS **PROGRAMMERS**

DOS/VS/E c. £13K **SYSTEMS PROGRAMMERS**

Continued software expansion is the key reason why many of our clients require the above professionals. We at Independent Software Support require in house Systems Programmers for our expanding support Group.

You will have about 3 years' DOS/VS, DOS/VSE experience and be looking for a more rewarding and challenging future.

The benefits are excellent and include some international

Assembler Programmers with 1-2 years' experience, c

Chief Technical Programmer, 212-213k. Must be able to lead up and motivate small team. Senior Programmer, PL 1 Assembler, 2714k neg. Programmer, PL1, 254k neg.

Senior Programmer, IBM, Cobol, CICS, good prospects for advancement within company, £84k.



PROGRAMMERS

Must have COBOL DI./1 experience: CICS an asset.
To start Feb. / March 1981:
RESHT

Regenmers, exp. RSX 11M and Cotal or Magro 11 gained in a compercial environment or good PL1 exp. required.

Please addition Dephase Joseph

FORCE 8 Computer services

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POLYTECHNIC OF THE SOUTH BANK Department of Mathematical Sciences and Compute

> **PRINCIPAL LECTURER IN COMPUTING**

LECTURER II/SENIOR LECTURER IN COMPUTING

AND TEMPORARY LECTURER II IN COMPUTING

A Principal Lecturer is required for April, 1981, and in Lecturer II/Senior Lecturer for September, 1981, to Main Computing in the Department of Mathematical Science and Computing. This is a lively department, able to department, able to depart excellent career opportunities in most areas of a subject. It provides a range of professional Computer Studies courses at both undergraduate and postgradual levels, and is currently expanding into Computer seasons. It is strongly associated with the Microcomputer and Advisory Centre for the Polytechnic.

The Principal Lecturer is required in order to seek course development and encourage research and one tancy work. A higher degree in Computing is designed together with research and teaching splitty and similarities experience in education and/or industry. The is available to specialists in either Computer Seek Data Processing.

The Lecturer II/Senior Lecturer is required to teach one assist in the administration of the department's south

The Temporary Lecturer II is required as soon as post the semporary Lecturer II is required as soon as puritive appointment terminating on August 31, 1981. The position would involve teaching Computing and positive a small commitment to the Microcomputer Advistication. Commitment to the Microcomputer Advisting and a subject specialism which includes promiting and a subject specialism which includes promiting. Teaching experience is desirable but not easents.

Application form and further particulars available for Staffing Office, Polytechnic of the South Bank, Border Road, London, SET DAA (Tel: 81-828 8989, Ert. 2023)

Super Opportunity for Supervisor, Shift Leader and Operator

to strengthen the existing operations team of a major West London Installation

A two megabyte IBM 3031, running under DOS/VS and POWER/VS is utilised, but software will be upgraded to DOS/VSE and VM in the near future. Database facilities are provided by DL/1 and the teleprocessing system runs under CICS.

Salaries offered are competitive, conditions of employment are excellent and the benefits package

Operations Supervisor to £9,500

Responsible to the operations manager for the control of operations, support and job control departments, consisting of approximately 20 staff. An in-depth knowledge of DOS/VS and CICS is required plus previous operations supervisory experience. Training in VSE and VM will be provided

This is a key role requiring a high degree of management skills complemented by a strong technical background.

Above average holidays

• On-going technical training

• Excellent pension scheme

• Relocation package

Shift Leader c.£7,500

An experienced DOS/VS shift leader is required, preferably to lead a team of 4 operators working in a two shift rota between 7.30am and 10.45pm: A minimum of 2 years DOS/VS experience is required, preferably gained in an one-line environment. Training in DOS/VSE and VM will be provided as necessary.

Operator c.£6,000

Minimum of 1 year's DOS/VS or VSE experience. Additional training provided.

For further information please write to, or telephone Pat Barnes (24:hour answer service) quoting ref CW 102-1P



Capp House, 96 South End. Croydon CR9 3SD Computer and Professional Consultants



LUNDY-FARRINGTON LIMITED

The Company is a leader in the fields of OCR, MICR and Interactive Graphic Display systems. The following appointments carry very high salaries and other benefits including B.U.P.A. membership.

operate from a new office in the West London area.

with a history of sound accomplishments in the fields of OCR, MICR and Terminal Data Entry systems in Banking Finance and Commerce.

CAD/CAM Graphic Display

Systems, Location: W. London or Portsmouth

Written application should be made to the principal European office at LUNDY HOUSE, 18 ORDNANCE ROW, PORTSMOUTH, HANTS. PO1:3DN

A Subsidiary of LUNDY ELECTRONICS & SYSTEMS, INC. (AMEX LDY)

We've changed offices—can we change yours? SYSTEMS AND PROGRAMMING

ANALYST (BANKING)

One of the most successful Merchant Banks in the City is looking for a SYSTEMS ANALYST to join a steadily expanding department. Development of systems for new areas of banking operations has created the need for a person with at least 2 years' experience in Analysis who is a good communicator and has a background which includes, ideally, some ORGANISATION AND METHODS. The usual BANKING FRINGE BENEFITS will apply.

RPGII PROGRAMMER/ANALYST C. £9,000

A well-known multi-national in the electronics field is looking for a person with around 18 months-2 years' RPGII experience. The experience will have been gained in an IBM environment as our clients are major users and include SYSTEM 3, 34, 370 range and also 4300 equipment. An ESSENTIAL qualification for the successful applicant will be substantial INVENTORY CONTROL experience. reat package and EUROPEAN travel opportuninty.

MIDDLESEX SENIOR ANALYST/PROGRAMMER c. £10,000

A major name in the Distributive Trades is embarking on a major overhaul and redefinition of its systems. To assist with this development they need a person with PROJECT LEADING potential. The favoured career profile will include a MINIMUM of 2 years' COBOL programming followed by ANALYSIS or TEAM LEADING in a DOS/VSE environment. An excellent opportunity. Ref: R3183

PROGRAMMER/ANALYSTS

A distinguished OIL COMPANY with offices in the West End need a number of Programmer/ Analysts to assist with new development. Self-motivated candidates with a good NUMERATE Analysis to assist with new development. Self-motivated candidates with a good NUMERALE DEGREE and FORTRAN programming experience are invited to apply. A knowledge of OPERA-TIONS RESEARCH techniques gained in an IBM environment would be particularly advantageous.

ICL 1900/2900

OPERATOR

c.£6,000+

A well-known company in West London have a requirement for an Operator for their site which comprises both ICL 1900 and 2900 hardware. The necessary prerequisites are a very good knowledge of both Glls and VME/B. The company provides excellent opportunities for career advancement and further training together with very good staff benefits.

Ref: 319(

Targa are always pleased to hear from experienced Systems, Programming or Operations staff. If your career needs a boost, contact the office for an informal discussion with one of

c. £11,000 GREATER LONDON

CHIEF PROGRAMMER

A leading company in the leisure industry seeks a Chief Programmer to lead an existing team, Ideal candidates will be familiar with structured programming techniques and have the management skills to recruit, train and develop staff, together with the ability to assist at the systems design stage. A COBOL background is essential and exposure to recent IBM hardware together with CICS a definite advantage. Benefits include relocation, bonus and flexitime. Ref: R3184

SUSSEX ANALYST/PROGRAMMERS

There are two opportunities for RPGII ANALYST PROGRAMMERS in Sussex. We are looking for people with 18 months-2 years' experience gained in a Systems 34 or 38 environment. Exposure to manufacturing systems such as MATERIAL REQUIREMENTS PLANNING together with normal commercial systems would be helpful. Good conditions of employment apply and RELOCATION

CITY

SENIOR PROGRAMMER

Ref: R3150/201

Our client is an extremely well-established FINANCIAL institution offering a fine opportunity to skilled applicants. A new installation is going to mean plenty of "ground-floor" DEVELOPMENT work. Ideally, you should have BASIC + or BASIC + 2 experience of financial applications, probably in a DEC, SYSTIME or CMC installation. Superb conditions of employment and benefits are offered.

COBOL PROGRAMMERS

A leading City-based International Company seeks COBOL programmers with upwards of two years experience. Very bright young people with UNIVAC or IBM experience, together with an exposure to on-line programme development, DATABASE and sales order processing would be particularly welcome to apply. This is a development opportunity in an expanding company offering excellent

S. LONDON

ICL SYSTEM 4 OPERATOR Based in S. LONDON our client is looking for an experienced SYSTEM 4 operator. If you have

bessed in S. LONDON our client is looking for an experienced STSTEIN 4 Operator. If you have between 1-4 years' experience on SYS 4 and would like to progress our client would like to hear from you. There are possibilities in the future of moving on to their larger 2900 systems. The company also offer a first-class benefits package.

Ref: 2258

IBM OS/DOS OPERATORS

Vacancies exist for various levels of computer operators who have worked on IBM 360/370 range computers. A knowledge of either OS or DOS Operating Systems is preferred, however training will be given in all aspects of operations and technical areas. Excellent career prospects for people with the right eptitude and temperament together with man-management abilities.

TARGA COMPUTER SERVICES

6 Liverpool Street, London, EC2M 7NH - 01-283 9941

TEXACO

MVS Systems Programmer

Texaco Limited plans to convert its 2 x 4341 systems from DOS/VSE to MVS. The feasibility study will start very soon and implementation should commence mid-1981. The complete process is expected to take two years: one to plan and create the operating system, and one to convert the

We therefore need one experienced MVS person to join our team of five who with the support of consultants staff will be responsible first for planning and setting up the new system, and then for Keeping it working smoothly and at an advanced technical level,

The lob will be important, interesting and challenging Salary, depending on experience, will be in the range £8000 to £12000; plus the usual Texaco fringe benefits.

If you are interested, please contact:
Mr. R. Stonehouse, Manager, Technical Support Texaco Limited. I Knightsbridge Green, London SWIX 701 Telephone: 01-584 5000

NUMERICAL **ANALYST**

cations are invited for th

Applications are invited for the post of Numerical Analyst within the University's Computing Service. The successful applicant will give a supporting edvisory service to computer users in numerical methods as applied to the fields of engineering and applied science, and in the techniques of mathematical model building. The University has access to very powerful computing facilities and a wide range of different machine architectures. The applicant will be expected to give advice on the suitability of different numerical methods for the various computer systems available. He/she will be expecially concerned with the exploitation of new machine architectures such as vector and array, processors.

processors.
Applicants should normally possess a post-graduate qual-ification in numerical methods or a first degree with a large content of numerical energies. Experience of the application of numerical economics to precipal problems is highly desirable.

qualifications and experience (qualifications (2 copies) giving date of birth, curriculum vitas, and the memes and addressed of two referees should be sent to fire. P. Vaughan-Smith, Staffing Department, The University, Southampton 808 SNH, from whom further defaults can be obtained. Please require Ref. 1170/ACW.

BOX Nos.

,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的 我们就是我们的人,我们就是我们,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我们就是我们的人,我

CHILTERNS

AREA, USING THE LATEST HARDWARE AND SOFTWARE

velopment of major new systems and the installation of a modern mainframe. Database, on-line and financial modelling techniques are used, and remote minis with communications links are planned. We have been retained to recruit for the following posts:

PROJECT LEADER

SYSTEMS ANALYST £7,500-£8,500

This will interest analysts with upwards of two years' solid experience of commercial and accounting systems, ideally including some financial modelling.

(Ref. 329CW)

PROGRAMMER £6,500-£7,500
The requirement is for at least two years' COBOL, on any hardward ideally including mainframe on-line applications. (Ref. 330CW)

Please ring us in confidence for an initial talk, quoting the appropriate reference, or leave a message on our answering machine after hours and well

52-53 Margaret St. London W1N 7FF 5796

WORK ON NEW SYSTEMS IN A PLEASANT

Our clients are expanding their DP services to cope with the de-

Sound commercial analysis experience (probably over five years) and good leadership qualities are required, ideally with knowledge of database and communications.

(Ref. 328CW)

PROGRAMMER .

Working conditions are first-class (purpose-built computer centre), and career prospects in a successful, thriving organisation are good. There are valuable fringe benefits, and in certain circumstances generous relocation expenses will be offered.

THE HIGH TECHNOLOGY TASK FORCE

COMMUNICATIONS SYSTEMS
COMPUTER SYSTEMS AND SERVICES
AMATION SYSTEMS AND SERVICES WORLDWIDE

PROGRAMMER? BECOME A TECHNICAL CONSULTANT

LOOK WHAT IT TAKES!

THE PERSON 2-3 years' experience of commercial application programming in DEC BASIC + under RSTS/E and the ability to linise with clients.

THE JOB Converting functional systems design to computer systems design, implementing tailor made customer systems, and adapting standard packages to users requirements.

THE REWARD A top salary, it swift and clear promotion path within a respected and established multi-million turnover group based in London but with provincial offices. Big company perks and travel and accommodation allowances when working away, plus many other benefits.

COBOL PROGRAMMERS?

PROGRESS NOW TO SENIOR PROGRAMMER

THE PERSON 3-5 years' experience of on-line IBM COBOL using VSAM and CICS, the ability

THE PERSON 3-3 years' experience of on-line IBM COBUL using VSAM and CICS, the ability to control a team of 3-4 programmers.

THE JOB Developing a new on-line foreign exchange system for a major bank in the City. An understanding of FSD and the ability to produce first class program spees is essential.

THE REWARDS £10-11k per annum plus non-contributory pension, life assurance, BUPA. Beneficial mortgage scheme, LVs, bonus and recreational, holiday and sporting facilities.

YOU KNOW WHAT YOU ARE WE KNOW WHAT YOU CAN BECOME

lf you feel you would be a suitable candidate for any of these opportunities, don't hesitate, contact Janine Jackson now on 01-734 9723 (Reverse charges if outside 01) and quote reference J11101120.

Licence No. SE(A) 4928. Employment Agencies Act 1973.

Charles Barker

Confidential Reply Service

Senior Systems

Analyst/Programmer

London North East/Borders of Essex

Salary from around £8,000

Our Client is seeking a Senior Systems Analyst/Programmer, who will report to the Data Processing Manager.

Duties will involve the provision of technical knowledge for all in-house computer systems, analysis and programming of minor systems changes, and assisting with the extension or replacement of current systems as

Applications are invited from those experienced in Cobol RPG programming and who are conversant with IBM Model 34. Candidates must have had

some formal training, at least one year's systems analysis experience and a minimum of three year's programming experience. Some experience of application within the insurance broking environment would be an

Senior ATE Programmer

SALARYCE10.000

IAL is a major name in the data communications field, developing advanced microprocessor systems to the highest standards. The Quality Control department now needs to appoint a Senior ATE Programmer.

You will be required to liaise at all levels, both within the company and

with clients. For this, you must have a thorough knowledge of digital and analogue systems, experience with ATE and understanding telecommunication principles. A minimum of 4 years' experience in electronics, backed with an HNC; or equivalent, is essential. If you have a background in the RF/LF electronics field, it would be a distinct advantage.

IAL benefits include 4 weeks holiday plus bonus, staff restaurant,

social club, pension scheme and life assurance. Salary is dependent upon qualifications and experience and relocation expenses will be paid where necessary.

Please apply quoting ref. number K/014 to Sue Dillon, IAL, Actadio House, Hayes Road, Scothall, Middr. Tel. 01-534 5134

Vantage Computer Services Ltd

6 Poland Street, London WIV 3DG Telephone: 01-734 9723

JBA

Systems Designers London based

Experienced Systems Designers are required immediately by our client, a leading computer consultancy, to take a key vote in the design of a large real-time communications

Applicants should have at least six years in the design of mainframe applications and be capable of selecting hardware/software/packages for inclusion in a system. Direct involvement with database (DBMS), graphics or communications would be an asset. Excellent salaries according to experience,

Designers and Consultants

Surrey

c.£13k+Benefits

A newly founded systems company, specialising in information security products and services, require top level professionals already involved at the forefroit of advanced computer and communications technology.

As a senior member of a project team, you will be developing: MICRO BASED SYSTEMS, TRANSACTION PROCESSING SYSTEMS, SECURE DATA BASE AND NETWORK SYSTEMS and be working on PATTERN RECOGNITION and IMAGE PROCESSING. Knowledge of RSXTIM, Assembler, PASCAL and the Z80 micro, are some of the qualities sought.
An attractive benefits package supports the excellent salary. Contact: Brian Postles

Senior Analyst/Programmer

City £9.500 - £12,000 The Management Services Department of this international bank wish to appoint an experienced Analyst/Programmer to help develop and implement new banking systems for use throughout the world. Candidates must be well educated, have a sound programming background and proven analytical skills, preferably gained in a financial environment. Knowledge of IBM System 34 and RPGII would be a distinct advantage.

A good salary is coupled with all the usual banking benefits.

Contact: Isobel Bruce

Analyst/Programmers

London

up to £11.000

We have been retained by an international energy company to recruit experienced Analyst/Programmers to Join their Commerical Systems Group specialising in the development of business related computer systems on the IBM 4341 and HP3000 mini-

ideally applicants should be graduates although 'A' level education qualifications will be accepted. Successful candidates should have a minimum of two years' experience in commercial applications together with at least one year's experience programming in Commercial applications together with a reast time year a experience programming in COBOL gained on either the IBM 370, 4300 or comparable Hewlett Packard machines. An excellent salary together with good fringe benefits complete an attractive package. Contact: David Hendry

Systems Programmer

London

£9,500

29,000

This is a good opportunity to join a well established organisation who are market leaders in their field, and gain some valuable experience. A minimum of one year using MVS or OS with knowledge of some or all of the following VTAM, CICS, IDMS or RACIF. Fluency in Assembler would be an advantage as would

exposure to visi.

Consideration will be given to more experienced applicants and of course the salary adjusted accordingly.

Contact: Janet Chilvers

Senior Programmer

City

It is essential to have at least three years experience in PL/1 preferably working in a team environment and involvement to a high degree in the implementation of medium sized systems. Knowledge of CICS, IDMS and real-time systems would be a definite advantage. Excellent prospects can be offered by this international organisation who are currently involved in a major development plan, including the upgrade of hardware, to enable them to utilise the latest technology.

Contact: Janet Chilipers

Engineering Support Specialist

A leading manufacturing organisation with plaints and offices throughout Europe wishes to recruit a Senter Technical Specialist to take responsibility for a new Engineering Services Group The new function will provide Engineers and Users with local d.p. facilities using timesharing, packages or minis from an existing network. Candidates, preferably graduates in Computer Science, must have at least 3 years experience in computing and be competent programmers. A background of Engineering Systems/packages, modelling onlinesharing would obviously be an advantage. Ability to work closely with users is essential. Opportunity for travel.

Contact: Jist Baker

Junior Software Technician West London c. £6.000+Car+O/T

Following considerable gradual expansion, our Client, it market leader in mini and intero business systems; wishes to strengthen their engineering division with a mobile software lectinician

(cchnician)
A thorough understanding of file based systems, operating systems and diagnostics are the main qualities required. This is a juntor position but nevertheless an excellent opportunity to develop in a software role and move on to team leadership. Anyone already in the engineering area with a desire to move into software may also be considered. Excellent Company package.

Contact: Brian Postles

JAMES BAKER ASSOCIATES. International Personnel Consultants. 32 Savile Row, London W1.

Tel: 01-439 9311.

Mini/Micro Software E.E.C. Pkg. to £16K

Programmers, Systems Designers and Project Leaders with in-depth experience Project Leadors with in-depin experience of real-time systems are urgently required to join a number of project leams in Continental Europe. Of particular interest will be those candidates with a strong background in developing software for Communications or Process Control systems.

Whilst all applicants will be expected to be Whilst all applicants will be expected to be fluent in Assembler, Fortran, Algol or derivative languages, particular hardware exposure is not a requirement. All positions offered are on a permanent basis with relocation expenses and assistance in obtaining accommodation among the benefits our clients provide.

Ref: L/5/A

Jnr. Assembler & PL-1 Progs

City of London Salary to £7.5K

A renowned Financial and Investment Consortium, long established in The City, currently requires Junior Assembler and PL-1 Programmers for its recently upgraded IBM mainframe and mini-computer installation. Suitable candidates should have a minimum of one year's Assembler or PL-1 applications programming expo-

sure, although in certain cases IBM CO-BOL will be considered. Applications areas include Property and Portfolio Management, Debenture and Unit Trust Investment and Stocks/Shares Up-Date. In-house training and seminar courses will form an integral part of the education programme.

Ref: L/5/B

Real-Time Programmers

Central London Salary to £9K

A leading Systems House, based in Central London, is seeking to employ additional Programmers to join its young, innovative software development team. Candidates should have a degree in a numerate subject and at least two years' real-time programming experience in either FORTRAN, CORAL 66 or Assembler. Knowledge of particular hardware is not important, but

exposure to mini computers, in particular DEC's PDP range, HP2100, Prime 500 or Honeywell Level 6, would be advantageous. These positions will appeal to applicants who eniov working as a meember of a small team involved in the design, coding and testing of real-time software.

Ref: L/5/C

Management Consultants

City and West End Salary to £15K

Our clients have an enviable reputation as a Management Consultancy and Rescorch Organisation. The Company is now seeking several additional Consultants and Senior Consultants. All candidates are expected to have good personal communication skills, be self-confident and highly presentable. Generally, preference will be given to graduates aged 28-34 years with

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Ref; I./5/D

Process Control Programmers

Sth. London & Surrey Salary to £10K

A leading supplier of Industrial and Process Control Hardware and Systems Software is seeking to recruit Applications Programmers and Support Analysts for its U.K. Headquarters. All respondents must offer at least one year's experience in either Assembler or FORTRAN as a primary language whilst those with systems to ary language whilst those with exposure to PASCAL, BASIC or COBOL will be

favourably considered. You will play a sig-nificant role in all stages of software and systems development from product planning to installation and live running. Since travel both nationally and interna-tionally will form a significant part of the job function, mobility is an essential crite-rion for these positions. Ref: L/5/R

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PROGRAMMERS/PROGRAMMER

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[Ref. US81/1-A.]

A Frogrammer/Ahalyst is required to join the team currently engaged in the support of software in the graphics area. Applicants about preferably, be graphics of postgradustes; systems of applications experience in graphics software would be an advangage. /ge. /ef;U\$81/1-B,

A Programmer/Aristyst is required to join the team engaged in the administration of computer resources. The range of the work is nicely, in the production of software for computer accounting technically, in the production of software for computer accounting service, A certain amount of leason with computer users and institute representatives would star be involved. Applicants presentatives would star be involved. Applicants presentatives would star be involved. Applicants presentatives would star be involved. Applicants presentative representatives would star be involved. Applicants presented for interest in the star providing the world at the star providing the world star beautiful.

A Programmer/Aristyst is required to join the team providing the would stilt an applicant and user Education Services. The world would stilt an applicant and user Education Services. The world post graduates with programming appearance for interest in technical post graduates with programming appearance in Fortrain Services will be in the range Fairos in Fortrain delay commensurate with age, reswart qualifications and experience will be in the range Fairos to (8.470 Junder register) pure Certain and application forms are aveilable from the Australia Secretary. JLCs. 28. Guilford Street, Cridge, WC18, 102.

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SYSTEMS ANALYST

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Application form and job descrip-tion from Mr R. Stevens, Staffing Officer on 01-864 5311 Ext. 2001.

Ciosing date 19th February 1981

THE UNIVERSITY OF HULL

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programme with a MBM five years' programme, experience, preferably using COBOL in an ICL 2903 /4 en-fronment. Experience in on-line pro-gramming techniques would be an added advantage.

tions (6 copies) giving details (justifications and experience together with the names of two refers should be sent by February 13, 198 to the Personnel Officer, University Hull, Hull Huld 7RX, from whom furth

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CW6/1 TRICIA

SYSTEMS ANALYST

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The London Branch of a major European bank is about to commence development of its banking systems and requires a SYSTEMS ANALYST to complement the existing team. The ideal applicant will have at least one year's experience as an Analyst and should have been involved in a project from feasibility to implementation, it is also essential that experience of FOREIGN EXCHANGE and REAL TIME systems forms part of the background. Excellent banking fringe benefits apply. Ref. R.3177.

Targa Computer Services which was established in 1978 is part of a group of companies serving the computer industry. We seek a CONSULTANT to expand activities within the more SENIOR range of applicants, ideal candidates will be over 25 with experience of SYSTEMS ANALYSIS or PROGRAMMING and have the ability to assess people and communicate effectively at all levels, advantage incentives and benefits are offered. Ref: R.3187.

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upwards of two years' experience. Very bright young people with UNIVAC of IBM experience, together with an exposure to on-line programme development. DATABASE and sales order processing would be particularly welcome to apply. This is a development opportunity in an expanding company offering excellent fringe benefits. Ref: R.3182. PROGRAMMERS (BANKING) £7-10.000 We require programmers and SENIOR programmers for leading city-based. European banks. AIMS experience is essential and demonstrable supervisory of management abilities will be required by the senior people. The usual fringer benefits will apply. Ref; R.3176/8.

Several analyst programmers are required to work in a recently installed UNIVAC 1100/81 installed in FILE-TAB. UNITED and applications work on FINANCIAL or MANUFACTURING systems is required. There is also a requirement for an ANALYST with consider able DATABASE experience. Ref: R.3124/3.

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A minimum of 5 years experience in an EDP/Business systems environment working as a Project Manager on complex multiprojects is required. You will participate in the initiation and preparation of long and intermediate term Ministry Plans for the effective use of professional staff and EDP equipment. You will also be responsible for the effective monitoring of systems to ensure adherence to the plans.

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to £11,780

A minimum of 5 years experience in complex business applications and project management is required. Specifically, you will be managing and/or co-ordinating a team of systems professionals who provide computer systems development, maintenance and production support to various branches of the Ministry. Exposure to IMS Data Base technology and online systems applications would be a decided asset.

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You will be involved in the translation of client needs into programming specifications and required to participate in the development and support of the Ministry's computer systems.

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Operator required for large installation situated on North West London/Middlesex
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J.4906
ICL 1900/2900 OPERATOR SURREY c. £6,200
Well-known electronics company in Surrey require an experienced operator to
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J.4956
ICL 2900 OPERATOR SURREY c. £6,000
Large company in the food industry requires an operator for their recently installed

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J.4921
ICL 1900/2900 OPERATOR LONDON C. £5,700

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J.4893

ICL 2900 OPERATORS LONDON c. £5,600 Two operators with Gli/DME experience are urgently needed by a West London, using a 2956. Useful company discounts. **IBM 4331 SNR OPERATOR** LONDON c. £7,000 This Computer Centre in South West London require a very experienced operator. At least 5 years' experience of DOS/VS is needed for this days only post. G.4920 **IBM 370 OPERATOR** BEDS/BUCKS

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IBM 3031 SHIFT LDR. LONDON C. £9,000

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LONDON
Large company in central London require an experienced operator, good JES2 and OSJCL required. At least 3 years' experience required. Good company benefits and

Prospects.

IBM 4331 OPERATOR SURREY/SUSSEX c. £6,250

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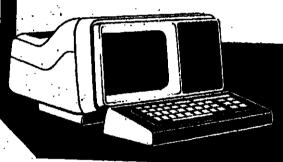
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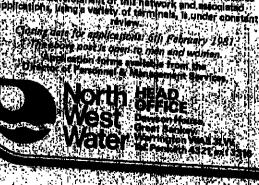
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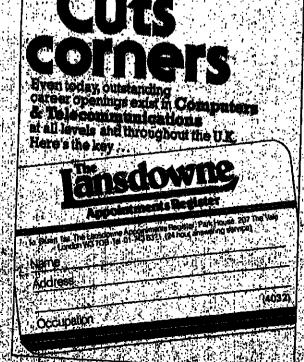
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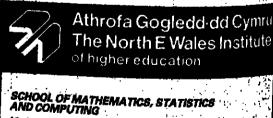
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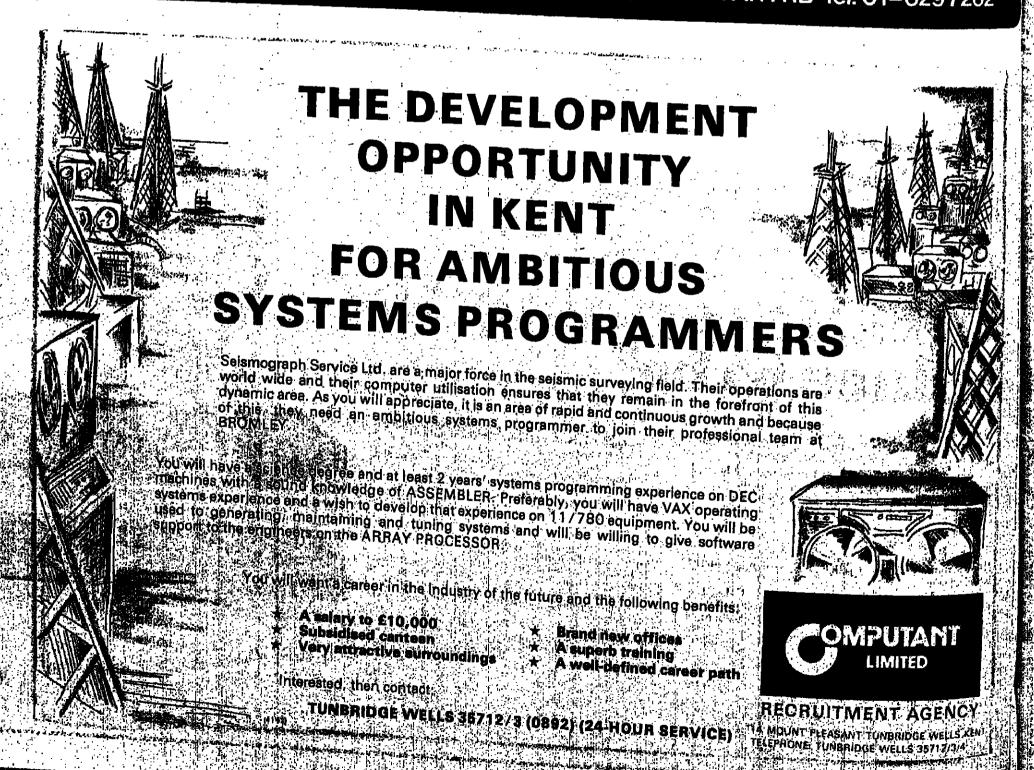
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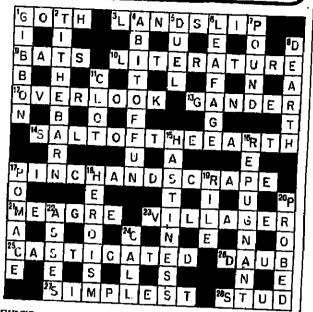


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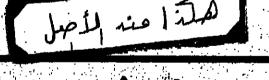
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do people buy? IN recent weeks several of my sales recruitment clients have investment.

If the same results could

asked when this column will get back to basic principles. When is there to be a return to a regular flow of commentary on selling practice for them to cut out and distribute to their salesmen? (Accompanied where appropriate by their own remarks, criticisms and demands!).

If the same results could have been achieved by obtaining a coffee-vending machine, they might have bought one of those instead. In other words, their requirement was not for an electronic machine with flashing lights. They simply needed to solve a specific business problem and

their own remarks, criticisms and demands!).

Remarkably, such questions have also been accompanied by the contribution of arbitrary comments like "I don't know how you keep thinking them up" and "it must be getting really difficult after all this time".

The fact is, writing the column is not in itself difficult; the real problems are finding the time and discovering new topics. (I must say you lot don't help too much with the latter!).

They simply needed to solve a specific business problem and gain the benefits of doing so.

Other emotional factors and political gain might have affected the situation and might even have been the deciding factor in a balanced competitive situation. The primary reason for buying, however, was to satisfy the need to have more effective warehouse control.

Similarly, the insurance salesman is not really selling an insurance policy, he is providing the political gain might have affected the situation. The primary reason for buying, however, was to satisfy the need to have more effective warehouse control.

Devious

topics will also get into the

Image

an insurance policy, he is providing the policyholder with the security of knowing The other day I was having that whatever tragedy might this kind of conversation with occur, his family will be proa client, who helped me to realise that I started this co-

Benefits

lumn three and a half years ago. Since then many people who missed the earlier issues The person who buys a par-ticular kind of car could be have moved into selling. motivated by a variety of dif Furthermore, a few remind-Furthermore, a few reminders on the same topics after all prestige, financial investthis time won't do the experienced salespeople any harm either. (Incidentally I have only rewritten one article since starting out and within 48 hours of the version's appearance I had a letter on my for a metal box on wheels.

sis is simple: Do not sell the So, just to keep Observant products merely on the f Cheltenham in the picture, strength of its specification of Cheltenham in the picture, I intend to return substantially to matters of basic settling forthwith. Many previous subjects will be revisited and hopefully some new topics will also not intend to return substantially to matters of basic settling forthwith. Many previous subjects will be revisited and hopefully some new topics will also not into the satisfactory.

TRADER

COURSES

Have you ever asked your-"Why do people buy?" Many people actually employed in selling have never really considered this question surprising when you consider programming prising when you consider how fundamental it is to indi-

vidual sales success. The gen- A COURSE on micropricesso

vidual sales success. The general assumption is that people buy things for what they are; perhaps the buyers even believe the same.

People buy to satisfy a need or desire. The actual produce or service they obtain is merely the means whereby that requirement is fulfilled. They do not buy the object they buy its implications, its limited or the idea it promotes.

A COURSE on microprikessor applications and programming will be held at the Coventry Mn agement Training Centre in Leanington Spa from March 3-5 and subsequently in May, June, September and November. The course delegates a chance to training in Basic to each detection in the course delegates a chance to training in Basic to each detection in the course delegates a chance to training in Basic to each detection. It is business environment. In a business environment, the client's need usually takes the form of a problem that needs to be solved. Whether the client is actually aware he has a problem is a matter for the salesman to resolve enry in the proceedings. A company, might, for lostance have problems relating to warehousing and distribution. The fact that the result of their deliberations is the purchase of a computer, where the fact that the purchase of a computer, is the purchase of a computer. the salesman to resolve early. in the proceedings. A company, might, for lostance, have problems relating to warehousing and distribution. The fact that the result of their deliberations is the purchase of a computer, is almost incleant.

chase of a computer, is aimost igrelevant.

Problem

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Problem

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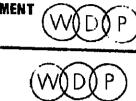
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